Vol. 1066 Number 2

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

PATENTS

May 13, 1986

U.S.
DEPARTMENT
OF COMMERCE

Patent
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Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

May 13, 1986 Volume 1066 Number 2

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $6.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office has been changed as of Feb. 9, 1986 and is announced in the *Official Gazette* at 1061 O.G. 30 on Dec. 31, 1985.

International PCT fees have been changed effective Jan. 1, 1986 and were announced in the *Official Gazette* at 1061 O.G. 30 on Dec. 31, 1985.

Note that the amount of the international search fee for the European Patent Office and the amounts of the International PCT fees will change effective June 1, 1986. For information on these fee changes see the notice appearing in the *Official Gazette* at 1065 O.G. 41 on Apr. 29, 1986.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority	
—No corresponding prior U.S. national application filed	420.00
—Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
if paid before June 1, 1986	830.00
if paid on or after June 1, 1986	930.00
International fees	
Basic fee (first 30 pages):	
if paid before June 1, 1986	325.00
if paid on or after June 1, 1986	375.00
Basic Supplemental fee (for each page over 30):	
if paid before June 1, 1986	6.00
if paid on or after June 1, 1986	7.00
Designation fee for the first 10 national or regional offices:	
if paid before June 1, 1986	80.00
if paid on or after June 1, 1986	90.00
Designation fee for 11th and subsequent designations	No charge

DONALD J. QUIGG,
Assistant Secretary and Commissioner of Patents and Trademarks.

Mar. 31, 1986.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on May 10, 1983, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,382,301 through 4,383,334
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98–622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED FEBRUARY 23, 1986 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,316,293	06/241,205	2/23/82
4,316,344	06/218,718	2/23/82
4,316,361	06/223,348	2/23/82
4,316,423	06/238,419	2/23/82
4,316,463	06/228,628	2/23/82
4,316,745	06/221,432	2/23/82

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,408,776, Re. S.N. 786,813, Filed Oct. 11, 1985, Cl. 280/261, THREE WHEEL VEHICLE, Travis M. Randolph, et al., Owner of Record: *Inventors,* Attorney or Agent: John A. Waters, Ex. Gp.: 316

4,415,350, Re. S.N. 788,832, Filed Oct. 18, 1985, Cl. 71/77, AUXIN COMPOSITIONS OF PHENYL THIOESTERS OF INDOLE-3-ALKANOIC ACIDS AND THEIR USE AS AUXIN GROWTH REGULATORS, David A. Boyles, et al., Owner of Record: *S. D. S. M. & T Foundation Research Center, Inc., Rapid City, S. D.,* Attorney or Agent: Cecil C. Schmidt, et al., Ex. Gp.: 129

4,426,267, Re. S.N. 819,544, Filed Jan. 1, 1986, Cl. 204/192.R, PROCESS AND APPARATUS FOR THE COATING OF SHAPED ARTICLES BY CATHODE SPUTTERING, Wolf D. Munz, et al., Owner of Record: *Leybold Heraeus GMBH, Koln, West Germany,* Attorney or Agent: John E. Lynch, et al., Ex. Gp.: 112

4,507,044, Re. S.N. 827,109, Filed Feb. 7, 1986, Cl. 340/604, ROBOT AND CONTROL SYSTEM, Burleigh M. Hutchins, et al., Owner of Record: *Zymark Corp., Hopkinton, Mass.,* Attorney or Agent: Andrew F. Kehoe, et al., Ex. Gp.: 268

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

Service by Publication

A petition to cancel the registration identified below having been filed, and the notice of default of such proceedings sent to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, its assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, judgment will be entered against registrant and said registration will be cancelled.

EVESA of Texas, Inc., McAllen, Tex., Reg. No. 1,267,261, for the Mark "ROCHELLE", Canc. No. 15,032.

ERMA S. BROWN,
Administrator
of the Trademark Trial
and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner
for Trademarks.

Patents Available for License or Sale

General Electric Co. is prepared to grant non-exclusive licenses under the following patents upon reasonable terms to domestic manufacturers.

Applications for licenses may be addressed to: Patent Counsel, Aerospace Control Systems Dept., General Electric Co., P.O. Box 5000, Binghamton, N.Y. 13902.

4,551,657. FORMAT RECONFIGURABLE CRT DISPLAY.
4,568,819. PRESSURE-SENSITIVE ELECTRONIC SOLDERING/DESOLDERING TOOL.

Applications for license may be addressed to: Group Patent Counsel, Major Appliance Business Group, General Electric Co., Appliance Park, AP2-225, Louisville, Ky. 40225.

3,512,637. STATIS SOLID STATE MODULARIZED ELECTRONIC CONTROL FOR HIGH SPEED CONVEYOR SORTING DEVICE.
3,512,638. HIGH SPEED CONVEYOR SORTING DEVICE.
3,580,391. SOLID STATE PULSED ELECTRONIC CONTROL FOR HIGH-SPEED SORTING DEVICE.
3,603,444. HIGH-SPEED SORTING DEVICE.
4,031,911. LAUNDRY MACHINE IMPROVED WATER TEMPERATURE CONTROL AND METHOD.
4,163,702. PROCESS FOR RENDERING SURFACES PERMANENTLY WATER WETTABLE AND NOVEL PRODUCT THUS-PRODUCED.
4,211,090. HOUSEHOLD REFRIGERATOR WITH AIR CIRCULATION AND COOLING ARRANGEMENT.
4,217,760. VAPOR COMPRESSION CYCLE DEVICE WITH MULTI-COMPONENT WORKING FLUID MIXTURE AND METHOD OF MODULATING CAPACITY.
4,218,890. VAPOR COMPRESSOR CYCLE DEVICE WITH MULTI-COMPONENT WORKING FLUID MIXTURE AND IMPROVED CONDENSING HEAT EXCHANGER.
4,227,383. REFRIGERATOR INCLUDING THROUGH-THE-DOOR ICE SERVICE.
4,264,886. ON/OFF SWITCH.
4,285,210. SELF-CONTAINED HEATING AND COOLING APPARATUS.
4,297,853. RETRACTABLE HANDLE FOR AIR VALVE HEAT PUMP.
4,297,854. AIR VALVE HEAT PUMP.
4,297,855. AIR VALVE HEAT PUMP.

4,300,025. REFRIGERATOR DOOR SWITCH.
4,329,581. AMBIENT LIGHT SENSOR TOUCH SWITCH SYSTEM.
4,331,002. ROTARY COMPRESSOR GAS INJECTION.
4,332,429. HOUSEHOLD REFRIGERATOR AND METHOD OF CONSTRUCTION.
4,333,521. APPARATUS FOR THAWING FROZEN FOOD.
4,346,565. GRAVITY DEFROST.
4,346,566. REFRIGERATION SYSTEM GRAVITY DEFROST.
4,358,935. APPARATUS TO PRESERVE VEGETABLES.
4,359,812. METHOD OF MAKING A JOINT.
4,369,479. SAFETY POWER CUTOFF FOR APPLIANCES.
4,371,067. DRIVE ARRANGEMENT FOR A WASHING MACHINE.
4,381,432. ELECTROMECHANICAL TIMER WITH IMPROVED SHORT INTERVAL ACCURACY.
4,382,382. MULTILEVEL LIQUID SENSING SYSTEM.
4,384,460. MEANS AND METHOD FOR MODULATING AND CONTROLLING THE CAPACITY OF A VAPOR COMPRESSION CYCLE DEVICE.
4,392,358. APPARATUS AND METHOD OF DETECTING FAILURE IN A REFRIGERATOR DEFROST SYSTEM.
4,393,661. MEANS AND METHOD FOR REGULATING FLOWRATE IN A VAPOR COMPRESSION CYCLE DEVICE.
4,406,401. WATER TEMPERATURE CONTROL SYSTEM FOR A WASHING MACHINE.
4,410,329. WASHING MACHINE WITH OVERSUDS DETECTION AND CORRECTION CAPABILITY.
4,411,664. WASHING MACHINE WITH OUT-OF-BALANCE DETECTION AND CORRECTION.
4,427,867. POWER DIVIDER FOR MICROWAVE OVEN.
4,430,557. COOKING APPARATUS HAVING INTERNAL PRESSURIZING SOURCE AND INTEGRAL HEAT SOURCE.
4,446,910. TWO-PHASE THERMAL STORAGE MEANS AND METHOD.
4,457,545. DOOR LATCH ASSEMBLY.
4,458,126. MICROWAVE OVEN WITH DUAL FEED EXCITATION SYSTEM.
4,463,239. ROTATING SLOT ANTENNA MICROWAVE OVEN FEED.
4,464,554. DYNAMIC BOTTOM FEED FOR MICROWAVE OVENS.
4,465,924. PROTECTIVE CONTROL ARRANGEMENT FOR DUTY CYCLE CONTROLLED SHEATHED HEATING ELEMENTS.
4,468,461. MICROBIOLOGICAL REMOVAL OF CHROMATE FROM CONTAMINATED WASTE WATER.
4,469,383. REFRIGERATOR CABINET AND METHOD OF CONSTRUCTION.
4,473,732. POWER CIRCUIT FOR INDUCTION COOKING.
4,476,946. WEIGHT MEASURING ARRANGEMENT FOR COOKING APPLIANCE SURFACE UNIT.
4,480,164. FOOD BROWNING SYSTEM INCORPORATING A COMBINED MICROWAVE AND HOT AIR OVEN.
4,481,404. TURN-OFF CONTROL CIRCUIT FOR SELF-CLEANING OVENS.
4,481,409. METHOD AND APPARATUS FOR LIMITING THE EVAPORATION RATE OF LIQUIDS HEATED BY COOKING APPLIANCE SURFACE UNITS.
4,489,234. RADIANT-ENERGY HEATING AND/OR COOKING APPARATUS WITH HONEYCOMB COVERPLATE.
4,492,017. METHOD OF ASSEMBLING A RIGID WIRE FOR DRIVEN ROTATIONAL MOVEMENT.
4,493,976. PYROLYTIC OVEN CLEANING SYSTEM.
4,493,980. POWER CONTROL ARRANGEMENT FOR AUTOMATIC SURFACE UNIT.
4,493,981. BOIL DRY PROTECTION SYSTEM FOR COOKING APPLIANCE.
4,495,485. TOUCH CONTROL ARRANGEMENT FOR DATA ENTRY.
4,496,814. MICROWAVE EXCITATION SYSTEM.
4,496,817. AUTOMATIC FIRE DETECTION FOR A MICROWAVE OVEN.
4,499,368. UTENSIL REMOVAL DETECTION SYSTEM FOR COOKING APPLIANCE.
4,504,719. DOOR LATCH AND METHOD OF ASSEMBLY.
4,507,529. FOOD EMISSION SENSING.
4,507,530. AUTOMATIC DEFROST SENSING ARRANGEMENT FOR MICROWAVE OVEN.
4,510,362. MICROWAVE OVEN RACK DESIGN.
4,523,069. MICROWAVE OVEN DOOR SEAL.
4,525,608. TIMER MECHANISM WITH IMPROVED INTERVAL ACCURACY.
4,529,809. METHOD FOR PRODUCTION OF ARYL SUBSTITUTED ESTERS.
4,533,810. START CIRCUIT FOR MICROWAVE OVEN.
4,534,179. AIR CONDITIONING APPARATUS.
4,536,420. PROCESS AND COMPOSITION FOR PRODUCING PERMANENTLY WATER WETTABLE SURFACES.
4,540,541. METHOD FOR MAKING PLASTIC ARTICLES FROM RESIN.
4,547,642. COMBINATION MICROWAVE AND THERMAL SELF-CLEANING OVEN WITH AN AUTOMATIC VENTING ARRANGEMENT.
4,549,644. ARTICLE ACCUMULATOR AND TRANSFER SYSTEM AND METHOD.
4,551,618. COOKING APPLIANCE INCORPORATING HEATER ENERGY COUNTER MEANS.
4,557,537. ELECTRICAL GROUNDING ARRANGEMENT AND METHOD.
4,558,264. CURRENT CONTROL METHOD AND CIRCUIT FOR ELECTRONICALLY-COMMUTATED MOTORS.
4,561,002. CAPACITIVE TOUCH SWITCH ARRANGEMENT.
4,571,581. APPARATUS AND METHOD FOR PRODUCTION LINE LEAKAGE TESTING OF MICROWAVE OVEN CAVITIES.

Interested parties should contact: B. J. Murphy, Patent Dept., Ingersoll-Rand Co., 19 New England Ave., Piscataway, N.J. 08854, 201-981-0411.

4,141,677. SCROLL-TYPE TWO STAGE POSITIVE FLUID-DISPLACEMENT APPARATUS WITH INTERCOOLER.
4,157,234. SCROLL-TYPE TWO STAGE POSITIVE FLUID-DISPLACEMENT APPARATUS.
4,260,402. HOUSING MEANS FOR DEFINING AN AIR/OIL SEPARATOR AND OIL RESERVOIR ASSEMBLY.
4,270,885. UNLOADING MEANS FOR A GAS COMPRESSOR.

4,304,296. BODY ASSEMBLY FOR A FLUID COOLER.
4,337,984. LUBRICATION MEANS FOR A JOURNAL AND BEARING.
4,382,754. SCROLL-TYPE, POSITIVE FLUID-DISPLACEMENT APPARATUS WITH DIVERSE CLEARANCES BETWEEN SCROLL ELEMENTS.

4,069,779. BUTTON HOLDER. *Alice V. Klein,* 2535 Homehurst Ave., Pittsburgh, Pa. 15234.
Des. 276,307. TIE-DOWN BRACKET FOR CLAMPING SHEET METAL ROLL TO CARRIER FLATBED. *Mr. Michael J. Hess,* 55940 Buckhorn Rd., Three Rivers, Mich. 49093.
SN# 649,312. CAPACITIVE TACTILE SENSOR. *Nelson R. Kellogg,* 1200 N. Quaker La., Alexandria, Va. 22302, 703-379-6530.

Department of the Treasury
U.S. Customs Service
(T.D. 86-75)
Recordation of Trade Name: "CRYOMEC, INC."

Agency: U.S. Customs Service, Department of the Treasury
Action: Notice of Recordation
Summary: On Sept. 25, 1985, a notice of application for the recordation under section 42 of the Act of July 5, 1946, as amended (15 U.S.C. 1124), of the trade name "CRYOMEC, INC." was published in the Federal Register (50 FR 38939). The notice advised that before final action was taken on the application, consideration would be given to any relevant data, views, or arguments submitted in opposition to the recordation and received not later than Nov. 25, 1985.

Stremikon Corp., a Michigan corporation, commented in opposition to recordation of the trade name, citing concern that "CRYOMEC, INC." is confusingly similar to Stremikon Corp.'s "CRYO-MED" trademark registered on the Principal Register of the United States Patent and Trademark Office (Reg. No. 1,068,060) used for refrigerator installations and parts thereof. Cryomec, Inc. is the owner of the registered and recorded "CRYOMEC IN DESIGN" service mark (Reg. No. 1,228,721).

We find that the two marks lawfully co-exist. Therefore, genuine articles bearing the "CRYO-MED" trademark shall not be seized or detained as confusingly similar to "CRYOMEC, INC."

Accordingly, as provided in section 133.14, Customs Regulations (19 CFR 133.14), the name "CRYOMEC, INC." is recorded as the trade name used by Cryomec, Inc., a corporation organized under the laws of the State of Calif., located at 1265 N. Kraemer Blvd., Anaheim, Calif. 92806. The trade name is used in connection with the following goods, manufactured in the United States: pumps, particularly reciprocating and centrifugal pumps for cryogenic liquids, cryogenic vaporizers, and conversion systems for converting cryogenic liquids to a gas, and related equipment, including heat exchangers.
Effective Date: Apr. 11, 1986.
For Further Information Contact: Harriet Lane, Entry, Licensing and Restricted Merchandise Branch, U.S. Customs Service, 1301 Constitution Ave., NW., Washington, D.C. 20229 (202-566-5765).

DONALD W. LEWIS,
Apr. 8, 1986. *Director, Entry Procedures and Penalties Division.*

PATENT NOTICES

Certificates of Correction for the Week of May 13, 1986

D. 280,923	4,548,681	4,563,387	4,567,332
D. 282,099	4,549,045	4,563,447	4,567,387
4,184,070	4,549,136	4,563,485	4,567,501
4,353,241	4,549,160	4,563,692	4,567,811
4,385,074	4,549,609	4,563,842	4,568,139
4,422,162	4,550,267	4,563,923	4,568,232
4,429,306	4,551,075	4,563,926	4,568,237
4,445,164	4,552,249	4,563,944	4,568,.23
4,466,810	4,552,288	4,564,111	4,568,422
4,475,629	4,552,616	4,564,366	4,568,454
4,481,519	4,552,635	4,564,446	4,568,560
4,503,345	4,553,255	4,564,454	4,568,581
4,515,906	4,553,786	4,564,473	4,568,789
4,518,144	4,554,576	4,564,487	4,568,798
4,524,813	4,554,580	4,564,613	4,568,806
4,529,897	4,555,524	4,564,649	4,568,863
4,529,934	4,556,245	4,564,670	4,569,084
4,532,909	4,557,184	4,565,066	4,569,689
4,533,658	4,557,732	4,565,636	4,569,793
4,533,792	4,558,274	4,565,699	4,569,907
4,534,828	4,558,454	4,565,821	4,569,937
4,535,278	4,560,189	4,566,103	4,569,990
4,535,729	4,560,273	4,566,179	4,570,088
4,536,550	4,560,706	4,566,242	4,570,907
4,537,420	4,560,708	4,566,315	4,570,914
4,538,521	4,560,747	4,566,452	4,570,931
4,540,733	4,560,816	4,566,534	4,571,163
4,540,836	4,561,006	4,566,666	4,571,196
4,541,873	4,561,017	4,567,000	4,571,209
4,543,353	4,562,260	4,567,047	4,573,125
4,544,553	4,562,406	4,567,059	4,573,940
4,544,630	4,562,499	4,567,211	
4,547,790	4,562,648	4,567,216	

Disclaimers

3,605,901.—*George J. Grabowski,* Needham, *William B. Osborne,* Marlboro and *Rexford Wilson,* Framingham Centre, Mass. FIRE PROTECTION APPARATUS. Patent dated Sept. 20, 1971. Disclaimer filed Feb. 28, 1986, by the assignee, *Kidde, Inc.*

Hereby enters this disclaimer to claim 11 of said patent.

4,217,109.—*Olle Lennart Siwersson,* Helsingborg, *Arne Evert Wall,* Landskrona and *Jan Åke Torsten Loodberg,* Helsingborg, Sweden. COMPOSITION COMPRISING A PULVERIZED PURIFIED SUBSTANCE, WATER AND A DISPERSING AGENT, AND A METHOD FOR PREPARING THE COMPOSITION. Patent dated Aug. 12, 1980. Disclaimer filed Mar. 6, 1986, by the *inventors,* the assignee, *AB Scaniainventor, consenting.*

Hereby enters this disclaimer to claims 1, 2, 8, 10, 11, 12, 16, 17, 18, 25, 26, 27, 28 and 32 of said patent.

4,456,425.—*William V. McCarty,* and *Donald J. Thiemann,* Cincinnati, Ohio. MODULAR INLET GEARBOX FOR A GAS TURBINE ENGINE. Patent dated June 26, 1984. Disclaimer filed Feb. 28, 1986, by the assignee, *General Electric Co.*

Hereby enters this disclaimer to claims 1 through 6 inclusive of said patent.

Dedication

4,130,708.—*Charles B. Friedlander,* Glenshaw and *John C. McMullen,* Pittsburgh, Pa. SILOXANE URETHANE ACRYLATE RADIATION CURABLE COMPOUNDS FOR USE IN COATING COMPOSITIONS. Patent dated Dec. 19, 1978. Dedication filed Mar. 6, 1986, by the assignee, *PPG Industries, Inc.*

Hereby dedicates to the Public the remaining term of said patent.

Disclaimers and Dedications

3,559,844.—*Seymour Schlosberg,* East Brunswick, N.J. MANHOLE PROTECTION RING. Patent dated Feb. 2, 1971. Disclaimer and Dedication filed Mar. 14, 1986, by the assignee, *De Dietrich (USA), Inc.*

Hereby disclaims and dedicates to the Public the remaining term of said patent.

3,578,067.—*Seymour Schlosberg,* East Brunswick, N.J. SELF-COOLING MECHANICAL SEAL LUBRICATOR. Patent dated May 11, 1971. Disclaimer and Dedication filed Mar. 14, 1986, by the assignee, *De Dietrich (USA), Inc.*

Hereby disclaims and dedicates to the Public the remaining term of said patent.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

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	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
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PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF April 12, 1986

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	4-01-85
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	2-15-84
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	12-18-84
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	7-23-84
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	3-02-84
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	1-23-84
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	11-21-83
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—E. E. KUBASIEWICZ, Director	1-22-85
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	3-28-83
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	8-30-83
DESIGN, GROUP 290—K. L. CAGE, Director	1-03-84
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	7-12-83
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	12-24-84
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	8-18-83
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	4-25-84
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	7-01-85

Expiration of patents: The patents within the range of numbers indicated below expire during April 1986, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,435,460 to 3,441,959, inclusive

Plant Patents ..... Numbers 2,876 to 2,881 inclusive

REEXAMINATIONS

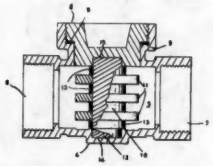
MAY 13, 1986

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,065,386 (502nd)
ALGAE GROWTH CONTROL

Robert A. Rigby, Canterbury, Australia, assignor to Algarid Pty. Ltd., Balwyn, Australia

Reexamination Request No. 90/000,723, Feb. 19, 1985.
Reexamination Certificate for Patent No. 4,065,386, issued Dec. 27, 1977, Ser. No. 696,502, Jun. 16, 1976.
Claims priority, application Australia, Dec. 10, 1975, 4244/75
Int. Cl.[4] C02F *1/48*
U.S. Cl. 210—695



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **4–6** is confirmed.

Claims **1–3** are cancelled.

New claims **7** and **8** are added and determined to be patentable.

4. A method as claimed in claim **2** and comprising the step of circulating said water from said storage, through a filteration unit and said magnetic field, and back to said storage.

B1 4,353,991 (503rd)
GLASS COMPOSITION AND METHOD OF MANUFACTURE AND ARTICLE PRODUCED THEREFROM

John F. Van Ness, Pittsburgh, and G. Edward Donaldson, Gibsonia, both of Pa., assignors to Ferro Corporation, Cleveland, Ohio

Reexamination Request No. 90/000,812, Jul. 2, 1985.
Reexamination Certificate for Patent No. 4,353,991, issued Oct. 12, 1982, Ser. No. 253,574, Apr. 13, 1981.
Int. Cl.[4] C03C *8/14, 8/16*
U.S. Cl. 501—20

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–25** is confirmed.

1. In a vehicle-suspended, fritted glass enamel composition, adaptable to be applied to, and fired to fusion on, a vitreous substance at a temperature from about 1000° F. to 1400° F., during which firing said vehicle is driven off, the improvement, in suspended, dispersed combination therewith, of a pigmenting amount of particulate, mica-based pearlescent pigment capable of retaining its pearlescent quality during and following said firing to fusion, so as to impart a pearlescent, translucent luster to the final, fused glass enamel.

B1 4,358,535 (504th)
SPECIFIC DNA PROBES IN DIAGNOSTIC MICROBIOLOGY

Stanley Falkow, Seattle, and Stephen L. Moseley, Kirkland, both of Wash., assignors to Board of Regents of the University of Washington, Seattle, Wash.

Reexamination Request No. 90/000,526, Mar. 12, 1984.
Reexamination Certificate for Patent No. 4,358,535, issued Nov. 9, 1982, Ser. No. 213,803, Dec. 8, 1980.
Int. Cl.[4] C12Q *1/70, 1/68*
U.S. Cl. 435—5

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim **4** is cancelled.

Claims **1, 2, 5, 7–12** and **17** are determined to be patentable as amended.

Claims **3, 6, 13–16** and **18–20**, dependent on an amended claim are determined to be patentable.

1. A method for detecting the presence of a pathogen in a clinical sample *consisting essentially of excreta or physiological fluid* suspected of containing said pathogen, said method comprising:

depositing said sample on an inert support;

treating said sample *without cultivation* to affix genetic material of any of said pathogen present in said sample to said support in substantially single stranded form at substantially the same site on said support where said sample was deposited;

contacting said fixed single stranded genetic material with a labeled probe having a nucleotide sequence of at least about 25 bases at least substantially complementary to a nucleotide sequence of a structural gene characteristic of said pathogen, said contacting being under hybridizing conditions at a predetermined stringency; and

detecting duplex formation on said support by means of said label.

B1 4,369,563 (505th)
AUTOMATED MACHINE TOOL INSTALLATION WITH STORAGE MEANS

David T. N. Williamson, London, England, assignor to Molins Limited, London, England and John Conventry Smith, Jr., Arlington, Va.

Reexamination Request No. 90/000,643, Oct. 3, 1984.
Reexamination Certificate for Patent No. 4,369,563, issued Jan. 25, 1983, Ser. No. 85,289, Oct. 29, 1970.
Continuation-in-part of Ser. No. 695,817, Dec. 4, 1967, abandoned, which is a continuation-in-part of Ser. No. 578,318, Sep. 9, 1966, abandoned, and Ser. No. 636,993, May 8, 1967, abandoned.
Claims priority, application United Kingdom, Sep. 13, 1965, 38937/65; May 12, 1966, 21223/66; Mar. 15, 1967, 12196/67; May 5, 1967, 21109/67
Int. Cl.[4] B23Q *7/00*
U.S. Cl. 29—568

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

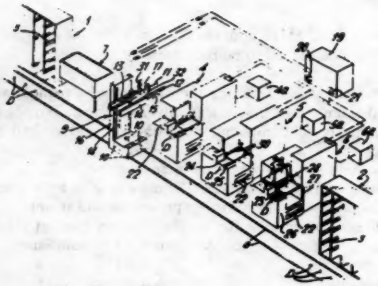
The patentability of claims **1–58, 62–146, 148, 150, 151, 157–162** and **179–181** is confirmed.

Claims **59**, **147**, **149**, **152–156**, **163**, **166**, **167**, **170**, **171**, **174–176**, and **182** are determined to be patentable as amended.

Claims **60**, **61**, **164**, **165**, **168**, **169**, **172**, **173**, **177**, **178**, **183**, and **184**, dependent on an amended claim, are determined to be patentable.

New claims **185–254** are added and determined to be patentable.

1. A machine tool installation for machining workpieces of different types requiring different machining operations and comprising a plurality of complementary numerically-controlled machine tools located adjacent a predetermined path, a store located adjacent said path and having a plurality of storage means for storing workpieces, transport means for transporting workpieces between the store and the machine tools along said path from which there is access to any of said storage means in the store and to any of the machine tools and operable to convey selected workpieces independently of other workpieces, and a central programmed control means and means connecting said central programmed control means with each of said machine tools and with said transport means to control movement of each of said workpieces by said transport means between a predetermined selection of the storage means in the store and a predetermined selection of the machine tools, and to control predetermined selected machining operations performed by each of the selection of machine tools on the workpiece, the pattern of movement of said workpieces along said path and the machining operations performed by said selection of machine tools on said workpieces being different for each of said types of workpieces.

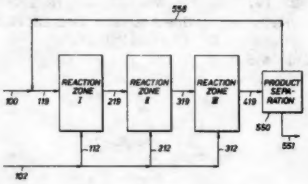


B1 4,408,081 (506th)

PROCESS FOR OXIDATION OF ISOBUTANE

Elton G. Foster, and Eugene F. Lutz, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Reexamination Request No. 90/000,753, Apr. 9, 1985.
Reexamination Certificate for Patent No. 4,408,081, issued Oct. 4, 1983, Ser. No. 308,629, Oct. 5, 1981.
Filed Apr. 9, 1985, Ser. No. 308,629
The portion of the term of this patent subsequent to Sep. 13, 2000, has been disclaimed.
Int. Cl.[4] **C07C** *179/02*
U.S. Cl. 568—571



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim **9** is cancelled.

Claim **1** is determined to be patentable as amended.

Claims **2–8**, dependent on an amended claim, are determined to be patentable.

New claims **10–17** are added and determined to be patentable.

1. In the preparation of tertiary-butyl hydroperoxide by the direct oxidation of isobutane in dense-phase reaction mixture at a reaction temperature in the range from about 140° C. to 170° C. and at a reaction pressure in excess of the critical pressure of the mixture and greater than about 700 psig, the improvement which comprises the steps of:

(a) conducting a plurality of essentially steady-state isobutane oxidation reactions, each reaction in one of a series of reaction zones, each zone containing an agitated dense-phase oxidation reaction mixture,
perature of the mixture,

[b**]** *(c)* introducing a continuous flow of isobutane reactant into the mixture of the first zone of the series,
flow of isobutane reactant into the mixture of the first zone of the series,

[c**]** *(d)* introducing a continuous flow of oxygen reactant into the mixture of each zone of the series,

[d**]** *(e)* withdrawing continuous flows of reaction mixture from each zone of the series, and

[e**]** *(f)* introducing each of the withdrawn flows into the mixture of the zone that is next subsequent to the one from which it is withdrawn, with the provision that the flow withdrawn from the last zone of the series is taken from the process as a tertiary-butyl hydroperoxide containing product mixture characterized by a conversion of isobutane of between about 3 and 25 percent.

REISSUES

MAY 13, 1986

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

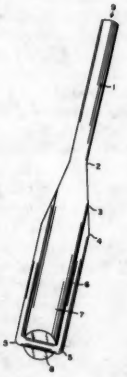
Re. 32,141
SINK SCRAPER AND GARBAGE TAMPER FOR ELECTRIC GARBAGE DISPOSAL

Alice V. Cosner, 859 E. Jeffery St., Apt. 411, Boca Raton, Fla. 33431

Original No. 4,395,792, dated Aug. 2, 1983, Ser. No. 168,719, Aug. 13, 1980. Application for reissue Jan. 27, 1984, Ser. No. 574,494

Int. Cl.⁴ A47L *17/02, 25/00*

U.S. Cl. 15—105 **1 Claim**



1. A device for scraping, directing, and tamping garbage to and through flexible splash guards that rim a drain opening leading directly into an electric garbage disposal unit positioned below a kitchen sink; said device being constructed in one solid piece and comprising: a cylindrically shaped main tamper body including a flat base surface for tamping and an axially extending side surface substantially perpendicular to said base surface; an integrally formed continuous ridge extending from the base surface and side surface of the main tamper body which bisects said surfaces to form three distinct ridge sections, one of said sections bisecting the base surface and the other two sections being diametrically opposed to one another and extending axially along the side surface *of the device* with a terminal portion of each of said two diametrically opposed ridge sections sloping toward the side surface *of the device*; and a cylindrically shaped handle integrally connected to the main tamper body and having a diameter [equal to about half] *less than* the diameter of the main tamper body[, a terminal portion of the side surface tapering to a diameter equal to that of the handle and with a slope equal to that of the terminal portion of each of said two diametrically opposed ridge sections].

Re. 32,142
METHOD AND APPARATUS FOR MAKING CARBONATED BEVERAGES

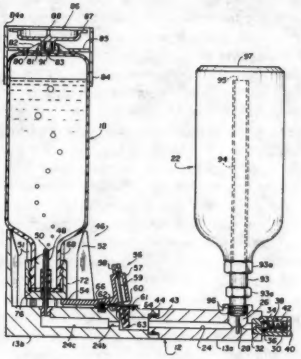
Louis B. Meyers, 3507 Oaks Way, Pompano Beach, Fla. 33060

Original No. 4,481,986, dated Nov. 13, 1984, Ser. No. 417,225, Sep. 13, 1982. Application for reissue May 22, 1985, Ser. No. 736,662

Int. Cl.⁴ C02D *1/00;* **B01F** *3/04*

U.S. Cl. 141—4 **15 Claims**

1. In an apparatus for making carbonated beverages, a supply of gas under pressure, and a *portable* container of liquid having an inlet connected with said gas supply to receive the gas therefrom for carbonation and pressurization of the liquid, means on said container spaced from said inlet operable to vent the gas from said container *to the atmosphere* during the supply of the gas thereto so that as the gas vents from said container



it agitates the liquid in said container to cause the liquid to change its surfaces presented to the supplied gas for more complete contact and saturation with the gas thereby to enhance the fuller carbonation of the liquid.

Re. 32,143
HOUSEHOLD TYPE SEWING MACHINE HAVING MICROPROCESSOR CONTROL

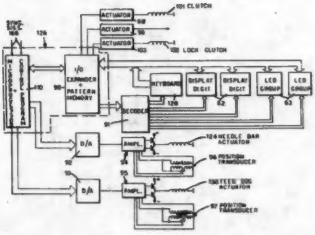
Gianfranco Carbonato, Turin, and Nereo Bianchi, Pavia, both of Italy, assignors to Necchi S.p.A., Pavia, Italy

Original No. 4,280,424, dated Jul. 28, 1981, Ser. No. 973,386, Dec. 26, 1978. Application for reissue Dec. 6, 1982, Ser. No. 447,016

Claims priority, application Italy, Feb. 21, 1978, 42904 A/78

Int. Cl.⁴ D05B *3/02*

U.S. Cl. 112—454 **89 Claims**



40. A household type sewing machine having a needle bar means disposed for enabling movement thereof relative to the direction of fabric feed in said sewing machine; feed means for adjusting the length and direction of said fabric feed; actuator means for adjusting the position of said needle bar means and the positional displacement of said feed means in response to control signals provided thereto; memory means for retrievably storing at least one predetermined stitch pattern having associated retrievably stored bight and feed data corresponding to predetermined positional

coordinates of said needle bar and feed means for defining associated stitch position coordinates for the stitches comprising said one stitch pattern; microcomputer processing means operatively connected to said memory means and to said actuator means for selectively processing said stored stitch pattern data from said memory means and providing output control signals to said actuator means based on said selectively processed stitch pattern data for controllably adjusting the relative position of said needle bar means and said feed means, said microcomputer processing means comprising system controller means capable of selectively controllably functionally operating on said stored stitch pattern data in response to input control signals for controllably redefining said stored stitch pattern data for selectively creating output control signals for said actuator means different from the output control signals corresponding to said one stored stitch pattern for redefining a stitch pattern arrangement different from said one stored stitch pattern; and control means operatively connected to said microcomputer means for providing said input control signals to said microcomputer processing means for initiating the selection of said one stored stitch pattern and an interpolation functional operation to be performed on said associated selected stored stitch pattern data for controllably adjusting the relative position of said needle bar means and said feed means for selectively providing a redefined final stitch pattern arrangement from said one stored stitch pattern, said system controller means comprising means for interpolating said stored stitch pattern data for said one selected stitch pattern in response to said input control signals provided from said control means for redefining said stitch position coordinates associated with said one selected stitch pattern by creating new stitch position coordinates in said one selected stitch pattern for generating said different output control signals to said actuator means, said actuator means being responsive to said different output control signals for providing an increased number of stiches for said one stored selected stored stitch pattern without varying the shape associated with said one stored selected stitch pattern for providing said redefined stitch pattern, whereby the density and/or proper length of said one stored selected stitch pattern may be controlled.

Re. 32,144

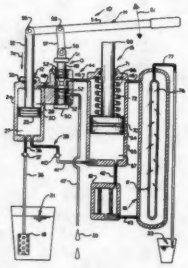
REVERSE OSMOSIS METHOD AND APPARATUS

Bowie G. Keefer, 4324 W. 11th Ave., Vancouver, B.C., Canada

Original No. 4,187,173, dated Feb. 5, 1980, Ser. No. 886,429, Mar. 14, 1978. Continuation-in-part of Ser. No. 782,540, Mar. 28, 1977, abandoned. Application for reissue Feb. 5, 1982, Ser. No. 346,364

Int. Cl.⁴ B01D *13/00*

U.S. Cl. 210—637 **24 Claims**



1. A method of [membrane separation of a feed fluid into permeate fluid and concentrate fluid fractions which respectively are permeated and rejected by selective membrane means, the membrane means being exposed to] *recovering energy from* pressurized [feed] fluid supplied by a reciprocating pump means having a cylinder and piston means and cooperating with valve means in conduit means, the piston means dividing the cylinder into a pumping chamber in which [feed] fluid is pressurized and an expansion chamber in which [the concentrate] fluid is depressurized; the method being characterized by steps of:

(a) inducting [feed] fluid into the pumping chamber by an induction stroke of the piston *means* and simultaneously exhausting [concentrate] fluid from the expansion chamber *through the valve means,*

[(b) reversing direction of force applied to the pump means and simultaneously hydraulically biasing the piston means against movement due to reversal of force so that reaction to reversal of force is transmitted to the valve means causing the valve means to shift in preference to relative piston means movement so as to mechanically shift the valve means to direct fluid flow between the pump means and the membrane means, the transfer of reaction forces causing a dwell period so that the valve means shifts across a closed intermediate position thereof during an interval of substantially zero fluid transfer in the expansion chamber thus incurring timely valve shifting,]

[(c)] (*b*) pressurizing the [feed] fluid in the pumping chamber by a compression stroke of the piston means which forces pressurized [feed] fluid to [the membranes,] *a load* and admitting [the concentrate] fluid [fraction] from the [membrane means] *load* into the expansion chamber *through the valve means* to supplement energy supplied to the piston in the compression stroke by using pressure of the [concentrate] fluid, *and*

(c) *preventing relative movement between the piston means and the cylinder by means of the fluid in the pump means during a dwell period between the induction and compression strokes of the pump means, whereby substantially no fluid is displaced from the cylinder by the piston means during the dwell period to facilitate timely shifting of the valve means during said dwell period.*

[(d) separating the feed fluid into a permeate fluid fraction which passes through the membranes, and a concentrate fluid fraction which is returned from the membranes to the expansion chamber to recover some fluid pressure for pressurizing the feed fluid.]

Re. 32,145

ORALLY ACTIVE TOLCICLATE [(AND TOLNAFTATE)]

Irving Shemano, Columbus, Ohio, assignor to Hercules Incorporated, Wilmington, Del.

Original No. 4,348,407, dated Sep. 7, 1982, Ser. No. 258,830, Apr. 29, 1981. Application for reissue Nov. 5, 1984, Ser. No. 668,452

Int. Cl.⁴ A61K *31/27*

U.S. Cl. 514—481 **5 Claims**

1. A process of suppressing fungal disease which comprises orally administering to a person infected therewith a therapeutically effective amount for antifungal purposes of [an antifungal agent selected from the group consisting of] tolciclate [and tolnaftate].

Re. 32,146

INSECT MATURATION INHIBITORS

Meyer Schwarz, Kensington; Richard W. Miller, Bowie, both of Md., and James E. Wright, Starkville, Miss., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Original No. 4,002,769, dated Jan. 11, 1977, Ser. No. 599,731, Aug. 1, 1975. Continuation of Ser. No. 141,620, Apr. 18, 1980, abandoned, which is a continuation of Ser. No. 002,083, Jan. 9, 1979, abandoned, which is a continuation-in-part of Ser. No. 498,165, Aug. 16, 1974, abandoned. Application for reissue Apr. 9, 1982, Ser. No. 367,010

Int. Cl.⁴ A01N *31/00, 31/14, 33/18*

U.S. Cl. 514—717 **2 Claims**

17. An insecticidally active composition which is effective against insect pupae, comprising:

an insecticidally effective amount of a compound selected from the group consisting of 2-methoxy-9-(p-ethylphenyl)-2,6-dimethylnonane, 2-ethoxy-9-(p-ethylphenyl)-2,6-dimethylnonane, 2-methoxy-9-(p-isopropylphenyl)-2,6-dimethylnonane, and 2-ethoxy-9-(p-isopropylphenyl)-2,6-dimethylnonane supported on an inert diluent carrier, said pupae being susceptible to maturation inhibition by said compound.

18. The composition of claim 17, wherein said compound is 2-methoxy-9-(p-isopropylphenyl)-2,6-dimethylnonane.

Re. 32,147

INSECT MATURATION INHIBITORS

Meyer Schwarz, Kensington; Richard W. Miller, Bowie, both of Md., and James E. Wright, Starkville, Miss., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Original No. 4,002,769, dated Jan. 11, 1977, Ser. No. 599,731, Aug. 1, 1975. Continuation of Ser. No. 141,620, Apr. 18, 1980, abandoned, which is a continuation of Ser. No. 002,083, Jan. 9, 1979, abandoned, which is a continuation-in-part of Ser. No. 498,165, Aug. 16, 1974, abandoned. Application for reissue Apr. 9, 1982, Ser. No. 367,011

Int. Cl.[4] A01N *31/00, 31/14, 33/18*

U.S. Cl. 514—717 **18 Claims**

17. A method of inhibiting the eclosion of insect pupae comprising:

adding to the habitat of said pupae an inhibiting amount of a compound selected from the group consisting of 2-methoxy-9-(p-ethylphenyl)-2,6-dimethylnonane, 2-ethoxy-9-(p-ethylphenyl)-2,6-dimethylnonane, 2-methoxy-9-(p-isopropylphenyl)-2,6-dimethylnonane and 2-ethoxy-9-(p-isopropylphenyl)-2,6-dimethylnonane supported on an inert diluent carrier, said pupae being susceptible to maturation inhibition by said compound.

18. The method of claim 17, wherein said compound is 2-methoxy-9-(p-isopropylphenyl)-2,6-dimethylnonane.

Re. 32,148

CONTROL APPARATUS FOR A COLOR TELEVISION RECEIVER

Jack Avins, Princeton, N.J., and Loren R. Kirkwood, Indianapolis, Ind., assignors to RCA Corporation, Princeton, N.J.

Original No. 3,679,816, dated Jul. 25, 1972, Ser. No. 128,704, Mar. 29, 1971. Application for reissue Jan. 24, 1977, Ser. No. 762,105

Int. Cl.[4] H04N *9/46*

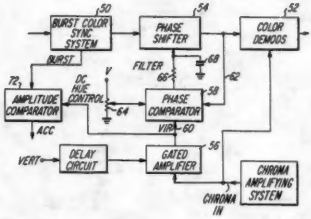
U.S. Cl. 358—27 **11 Claims**

1. In a color television receiver adapted to receive a television signal including a luminance component, a chrominance component modulated in both phase and amplitude, periodically recurring color synchronizing bursts occupying prescribed intervals during the horizontal retrace portions of said signal and a color reference signal occupying a prescribed interval during the vertical retrace portion of said television signal and being of substantially longer duration than said color synchronizing bursts, apparatus comprising:

first means for providing an oscillatory signal to demodulate said chrominance component [and produce color difference signals containing information proportional to the hue and saturation of the televised scene], said means being responsive to the television signal for recovering the color synchronizing bursts thereof and for utilizing said bursts to lock the frequency of the oscillatory signal to the frequency of such bursts and to lock the phase of the oscillatory signal to the phase of said bursts;

second means, including at least first and second chrominance demodulators responsive to said oscillatory signal, and also responsive to said television signal, for demodulating said chrominance component and producing color difference signal outputs representative of the hue and saturation of the televised scene;

[second] *third* means, also responsive to said television signal, for recovering said longer duration color reference signal and for utilizing said signal in developing a control



signal to adjust the phase of said oscillatory signal as a function of the phase of said reference signal; [and]

[third] *fourth* means responsive to said oscillatory signal and to said control signal for varying the phase of said oscillatory signal in a direction to correspond with the phase of said reference signal as represented by said control signal, *said fourth means comprising a variable phase shifter, external to said first means, and interposed between an output of said first means and said demodulators;*

whereby the degree of error in the hue of a reproduced color image attributable to such transmission characteristics as multipath, transmission line reflection and the like is correspondingly reduced

said apparatus also including fifth means for coupling the chrominance component of said television signal to said demodulators for demodulation with said phase-adjusted oscillatory signal to produce said color difference signals; and

sixth means responsive to said longer duration color reference signal and said color synchronizing bursts for varying the gain of said fifth means as a function of the amplitudes of said bursts and said reference signal.

PLANT PATENTS

GRANTED MAY 13, 1986

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,741
ROSE PLANT/VAR. MORMILLI

Ralph S. Moore, Visalia, Calif., assignor to Sequoia Nursery, Visalia, Calif.

Filed Nov. 19, 1984, Ser. No. 672,887
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—7 **1 Claim**

1. A new and distinct variety of miniature rose plant of hardy, dwarf, bushy, upright, much branched habit, substantially as illustrated and described, characterized by buds and flowers of exhibition form, essentially coral red in color with orangish highlights giving the opening buds and flowers a fluorescent glow, with reverse of petals being a slightly darker shade of red, and further characterized by a plant of compact well rounded shape, vigorous, with the main stems and shoots being moderately thorny, the said plant being easy to propagate from cuttings or by budding, with an abundance of medium small semi-glossy to matt foliage and an abundance of flowers borne singly or several to the stem in loose clusters.

5,742
MINIATURE ROSE PLANT/MORLYN

Ralph S. Moore, Visalia, Calif., assignor to Sequoia Nursery, Visalia, Calif.

Filed Jan. 27, 1984, Ser. No. 574,578
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—8 **1 Claim**

1. A new and distinct variety of miniature rose plant of hardy, dwarf, bushy, upright to spreading, much branched habit, substantially as illustrated and described, characterized by buds and flowers which are generally of a clear yellow color, with buds and flowers being similar in shape to Rise N'Shine (miniature—U.S. Plant Pat. No. 4,231) but smaller in size and with less petals; and further characterized by a plant similar to Cinderella (miniature—U.S. Plant Pat. No. 1,051—expired) which is vigorous and compact, the shoots and branches having short internodes, said plant being easy to propagate from cuttings and having an abundance of semi-glossy to matt foliage, with flowers borne singly or several to the stem in loose clusters.

5,743
ROSE PLANT JACICE

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Oct. 1, 1984, Ser. No. 656,920
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—14 **1 Claim**

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its nearly pure white buds and open flowers, long stems, few thorns and large disease resistant foliage.

5,744
PLUM TREE ("MID RED")

Chris F. Zaiger, 537 Rosemore Ave.; Leith M. Gardner, 1207 Grimes Ave.; Gary N. Zaiger, 1907 Elm Ave., and Grant G. Zaiger, 2121 Elm Ave., all of Modesto, Calif. 95351

Filed Nov. 16, 1984, Ser. No. 672,047
Int. Cl.[4] A01H *5/03*
U.S. Cl. Plt.—38 **1 Claim**

1. A new and distinct variety of plum tree, substantially as illustrated and described, which is a productive and regular bearer of large, yellow flesh, clingstone fruit with good eating, shipping and storage quality; the fruit is further characterized, in comparison to Casselman Plum (Non-patented) by ripening 7 to 10 days earlier, being larger in size and having a higher degree of red skin color.

5,745
PEACH TREE ("TOP CREST")

Chris F. Zaiger, 537 Rosemore Ave.; Leith M. Gardner, 1207 Grimes Ave.; Gary N. Zaiger, 1907 Elm Ave., and Grant G. Zaiger, 2121 Elm Ave., all of Modesto, Calif. 95351

Filed Nov. 16, 1984, Ser. No. 672,048
Int. Cl.[4] A01H *5/03*
U.S. Cl. Plt.—43 **1 Claim**

1. A new and distinct variety of peach tree, substantially as illustrated and described, characterized by its large size, vigorous and upright growth and being a regular and productive bearer of medium to large, very firm, yellow flesh, clingstone fruit; the fruit is further characterized in comparison to Royal April Peach (U.S. Plant Pat. No. 3,411), by maturing 2 to 3 days earlier, being more round in shape, having firmer flesh and greater storage and shipping characteristic.

5,746
BEGONIA PLANT NAMED KARITA

Hans J. Rohde, Nürtingen, Fed. Rep. of Germany, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed Sep. 20, 1984, Ser. No. 652,486
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A begonia plant named Karita, as described and illustrated, having medium pink double sterile flowers up to 5 cm. in diameter; medium size dark green crisp foliage; vigorous upright, self-branching mounded plant; year round flowering, and the ability to maintain good quality flowers for long periods of time.

5,747
BEGONIA PLANT NAMED KANON

Hans J. Rohde, Nürtingen, Fed. Rep. of Germany, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed Sep. 20, 1984, Ser. No. 652,478
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A begonia plant named Kanon, as described and illustrated, having rose pink double sterile flowers up to 6 cm. in diameter, medium size dark green crisp foliage; vigorous, upright, self-branching and mounded growth habit, flowering year round, and the ability to maintain good flower quality for long periods of time.

5,748
CHRYSANTHEMUM PLANT NAMED BRASS

William E. Duffett, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Aug. 27, 1984, Ser. No. 644,269
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—79 **1 Claim**

1. A new and distinct plant of *Chrysanthemum morifolium,* Ramat., named Brass, as described and illustrated, and particularly characterized as to uniqueness by the combined characteristics of flat capitulum form; decorative capitulum type; greyed-orange ray floret color; diameter across face of capitulum ranging from 6 to 7 cm. at maturity; uniform nine week flowering response; medium plant height when grown single stem; 10 to 15 cm. peduncles on open, normally terminal sprays, and 13° C. minimum temperature tolerance for initiation and development of flowering buds.

PATENTS

GRANTED MAY 13, 1986

ERRATA

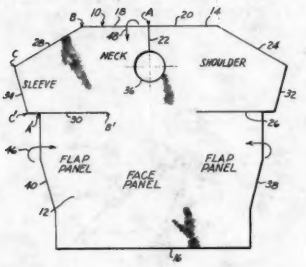
For CLASS	See PATENT NO.
530–379	4,588,691

PATENTS

GRANTED MAY 13, 1986

GENERAL AND MECHANICAL

4,587,671
OPEN, WRAPAROUND, SLEEVED GARMENT
Richard Rodriguez, Jr., and Joseph Israel, both of El Paso, Tex., assignors to American Hospital Supply Corporation, Evanston, Ill.
Filed Feb. 19, 1985, Ser. No. 702,985
Int. Cl.[4] A41D *1/04*
U.S. Cl. 2—69 **7 Claims**



1. A garment blank for an open, wraparound, sleeved garment having a face panel and two side flap panels integral with the face panel, each of which has an exposed edge and which side flap panels overlap at their respective exposed edges to close the garment, the garment blank comprising:

a sheet of flexible material defined by a generally straight first edge and a generally straight second edge extending generally parallel to and spaced from the first edge;

a first pair of nonparallel sleeve edges joined by a first sleeve end edge and a second pair of nonparallel sleeve edges joined by a second sleeve end edge, each pair of sleeve edges and related sleeve end edges defining a sleeve on the garment to be formed and each pair of sleeve edges comprising a first sleeve edge extending from the sleeve end edge to an end of the first edge and a second sleeve edge extending from the sleeve end edge as a slit in the sheet of flexible material substantially parallel to the first edge and for a length equal to the length of the first sleeve edge;

a first seam edge extending along the slit forming a second sleeve edge of the first pair of sleeve edges a length equal to one-half of the length of the first edge and a second seam edge extending along the slit forming a second sleeve edge of the second pair of sleeve edges a length equal to one-half of the length of the first edge;

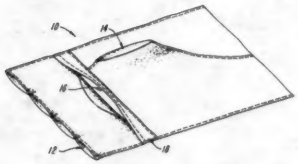
a third edge extending between an end of the first seam edge and an end of the second edge;

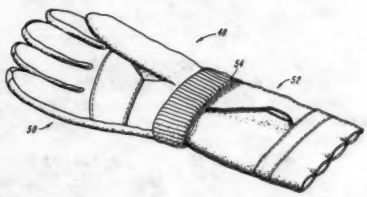
a fourth edge extending between an end of the second seam edge and the other end of the second edge;

a generally circular edge in the sheet of flexible material centered between the first edge and the two parallel second sleeve edges; and

a slit extending generally perpendicularly from the first edge at about the midpoint of the first edge and which slit diametrically intersects the circular edge.

4,587,672
COLD-WEATHER HAND COVERING HAVING SELECTIVELY SHAPED CHEMICAL HEATING ELEMENT RECEIVING CHAMBER
Herman Madnick, and Ralph F. Goldman, both of Framingham, Mass., assignors to Multi-Tech Corporation, Natick, Mass.
Filed Aug. 22, 1984, Ser. No. 643,020
Int. Cl.[4] A41D *19/00*
U.S. Cl. 2—158 **19 Claims**





1. Apparatus for actively supplying heat to the hands of a wearer, comprising:

an outer cold weather hand covering that is made of a water and wind resistant material and having a peripheral wall defining an opening for receiving the hand;

an inner liner dimensioned to be removably insertable into said outer cold-weather hand covering;

said inner liner including a hand receiving shell that is made of a fabric material and having a peripheral wall defining an opening for receiving the hand therethrough;

said liner including fabric means coupled to said hand receiving shell and cooperative with said shell for providing a selectively shaped chemical heating element receiving chamber having an opening;

said liner including a resealable closure coupled to said hand receiving shell and proximate said opening of said chamber for releasably retaining a selectively shaped chemical heating element slidably insertable into said chamber; and

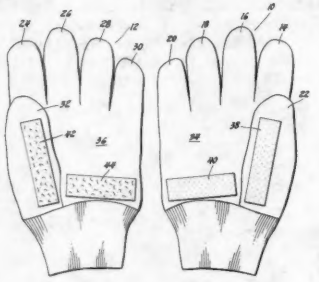
means coupled between said peripheral wall of said cold-weather hand covering and said peripheral wall of said hand receiving shell for mounting said liner for sliding motion into and out of said cold-weather hand covering so that it actively supplies heat to the hand when inside the outer covering and permits access to the chamber when it is outside the covering.

4,587,673

VOLLEYBALL PRACTICE GLOVES

Gregory A. Boliard, 6855 Lakeview, Apt. 4113, Westland, Mich. 48185

Filed Apr. 29, 1985, Ser. No. 728,040
Int. Cl.[4] A41D *19/00*
U.S. Cl. 2—161 A 4 Claims



3. Volleyball practice gloves, comprising:

a pair of fabric gloves, including a right-hand glove and a left-hand glove, each having a palm section;

the palm section of the right hand glove having pressure-sensitive connecting means; and

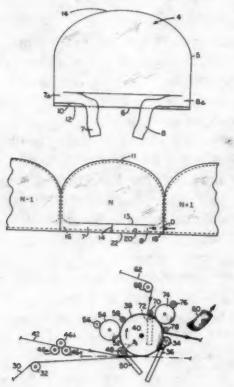
the palm section of the left hand glove having cooperating pressure-sensitive connecting means for releasably connecting the palm section of the right-hand glove to the palm section of the left-hand glove at such times as the gloves are being worn by a volleyball player, such that the player may strike a ball with both hands in a palm-to-palm relationship.

4,587,674

DISPOSABLE CAP WITH STRAPS

Frank Berlin, New York, N.Y.; Leonard McGuire, Tulsa, and Eugene Campbell, Bixby, both of Okla., assignors to Armin Poly-Version, Inc., Jersey City, N.J.

Filed Dec. 16, 1983, Ser. No. 564,072
Int. Cl.[4] A42B *1/04*
U.S. Cl. 2—195 6 Claims



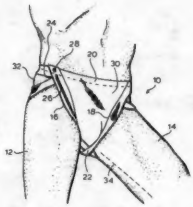
1. A disposable article of manufacture adapted to constitute a cap to be placed on the head of a user and comprising two face-to-face films of generally like configuration having interconnected peripheral edges defining an enclosure to receive said head, said enclosure having an opening to admit the head into said enclosure, one of said films including film strips adjacent said opening, said film strips constituting ties on said cap, said one film being provided with a T-shaped arrangement of slits adjacent said opening to form said ties in said one film, said films being of substantially equal breadth adjacent said opening, said strips cooperatively and substantially extending across the breadth of said one film at said opening, said films having parallel separated further edges adjacent and defining said opening, one of said slits being parallel to the further edge of said one film and extending less than fully across the breadth of the latter, the other of said slits extending between said one slit and the further edge of said one film.

4,587,675

TROUSERS WITH BUILT IN SHAPING STRAPS

Dwight Prouty, 1623 Third Ave., New York, N.Y. 10028

Filed Oct. 31, 1983, Ser. No. 546,873
Int. Cl.[4] A41D *1/06*
U.S. Cl. 2—227 6 Claims



1. A pair of trousers comprising:

two tubular leg portions having upper edges extending upwardly and away from a crotch to a point below the waist;

a pair of straps secured to said upper edges, each said strap extending down and inwardly from the waist and crossing and being attached to each other in the crotch, thereafter extending around the buttocks along said upper edges and being attached to the other said strap at said point below the waist;

first closure means along the upper, frontal portion of one said strap;

a triangular front panel, a top edge of said front panel defining a front portion of said waist, said front panel being secured to the frontal portion of said straps down to said crossing point; and

a five-sided rear panel, a top edge of said rear panel defining a rear portion of said waist, said rear panel being secured to the rear portions of said straps, said rear panel extending outwardly to said point below the waist and downwardly to said crossing point.

4,587,676

COLLAPSIBLE PROTECTING HELMET

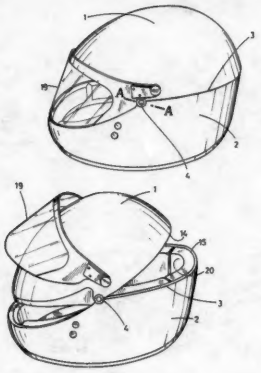
María A. S. Estadella, Bajada de la Gloria, 47, Barcelona, Spain

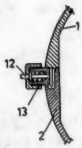
Filed Jan. 6, 1984, Ser. No. 568,803
Claims priority, application Spain, Jan. 13, 1983, 269734
Int. Cl.[4] A42B *3/02*
U.S. Cl. 2—424 12 Claims

1. A collapsible protecting helmet comprising:

a body including a first portion and a second portion, said portions abutting along a first line which is substantially parallel to a line which defines the bottom perimeter of the helmet, said portions being pivotable relative to one another between an unfolded position in which they engage one another substantially in the region of said first line, and a folded position in which said first portion is at least partially concealed in said second portion;

pivot means pivotably connecting said portions to each other; and





engagement means securing said first and second portion with each other in said unfolded position, said engagement means being formed as push-button operated spring-biased means.

4,587,677

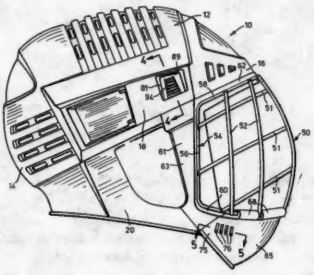
HELMET FACE MASK

Leonard W. H. Clement, Bolton, Canada, assignor to Cooper Canada Limited, Toronto, Canada

Filed Oct. 16, 1984, Ser. No. 662,991

Int. Cl.[4] A63B *71/10*; A42B *1/08*

U.S. Cl. 2—424 **7 Claims**



1. A clip for joining a first member to a second, the first member having an elongate element supported between resilient spaced apart brackets defining slots into which said elongate element can snap to extend therebetween the second member having a recess in the form of an elongate slot, the clip comprising two similar halves integrally pivoted together and defining adjacent the pivot region a receiving cavity for the elongate element, each half having resilient means adapted to co-act with the recess to be retained by and in the recess, the resilient means comprising the bifurcation of each half to define two resilient tines, with each tine having an external step projecting away from the other tine, each tine being adapted to engage a shoulder region of the recess, whereby to retain the clip within the recess.

4,587,678

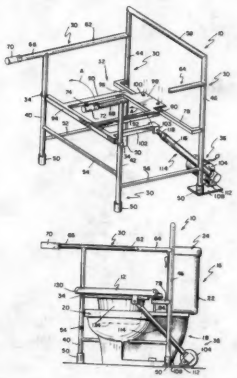
TOILET SEAT BOOSTER

Larry W. Love, 2020 Cunningham Rd., Speedway, Ind. 46224; Raymond G. Gray, Sr., 9149 Tanglewood Dr., Indianapolis, Ind. 46227, and Jerry A. Love, 510 Pioneer Dr., Indianapolis, Ind. 46217

Filed Feb. 4, 1985, Ser. No. 698,159

Int. Cl.[4] A47K *13/10*; A47C *1/02*

U.S. Cl. 4—251 **8 Claims**



1. A boosting device for a toilet seat comprising a

stationary frame includng first and second upright front frame members, first and second upright rear frame members, a first handrail extending between the first front and first rear upright frame members, and a second handrail extending between the second front and second rear upright frame members, each of the first and second handrails including a portion disposed forward of the respective first and second front upright frame members,

a movable seat frame assembly,

pivot means for pivotally coupling the seat frame assembly to the stationary frame, and

moving means for pivotally moving the seat frame assembly relative to the statinary frame, the movable seat frame assembly including a seat frame for supporting a toilet seat and a transverse seat frame member extending between the first and second front upright frame members and coupled to the first and second front upright frame members by said pivot means.

4,587,679

TOILET FLUSHING DEVICE

Chin-Lin Chen, No. 74, Lane 40, Ta-Hsing Street, Tainan, Taiwan

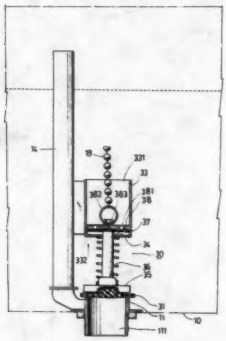
Filed Dec. 5, 1984, Ser. No. 678,458

Int. Cl.[4] E03D *1/34*

U.S. Cl. 4—388 **3 Claims**

1. A flush control device for the tank of a toilet including an inlet pipe and at the top thereof fitted with a flush valve the operation of which is controlled by a float, an operating lever having a portion thereof protruding outwardly from the tank and connected to a linking member having an end operatably secured with a discharge cover seated over a discharging pipe, the improvement comprises: a cylinder connected with said

linking member, including an opened upper end disposed intermediate the high water level and the low water level of said tank, and a bottom wall provided with an opening; a piston being slidable in said cylinder and dividing the space within said cylinder into an upper chamber and a lower chamber having volumes which vary with the sliding thereof, said piston being provided with axial through holes for communicating said upper and lower chamber; a baffle means mounted beneath said piston and flexing downwardly as said piston is pulled upwardly against the water pressure, the water in said upper chamber thus is admitted downwardly to said lower chamber, said baffle limiting water flow in the opposite direc-



tion; a piston rod having an end passing through said opening of said cylinder to connect with said piston, said discharge cover being mounted on the opposite end of said piston rod for sealing off said discharging pipe; a compression spring mounted on said piston rod and biasing said discharge cover away from said cylinder, whereby said discharge cover is pulled away from said discharging pipe against the force of said compression spring, the water held in said tank will drain through said flushing pipe, and flow downwardly into said lower chamber to resist said compression spring returning to its extended position and said compression spring gradually returning to its extended position and biasing said discharge cover tightly against said discharging pipe once again.

4,587,680

HAIR WASHING BASIN OR BOWL FOR HAIRDRESSERS

Kurt Brügger, Magden, Switzerland, assignor to Franco Scarnato, Ruschlikon, Switzerland

PCT No. PCT/CH83/00116, § 371 Date Jun. 11, 1984, § 102(e) Date Jun. 11, 1984, PCT Pub. No. WO84/01495, PCT Pub. Date Apr. 26, 1984

PCT Filed Oct. 13, 1983, Ser. No. 624,668

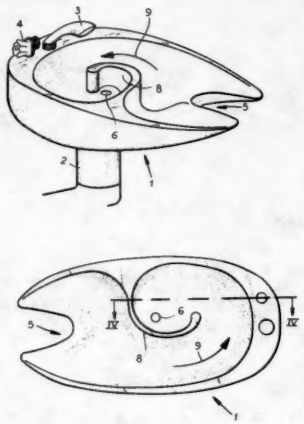
Claims priority, application Switzerland, Oct. 18, 1982, 6047/82

Int. Cl.[4] A45D *19/08, 19/10;* **E03C** *1/14*

U.S. Cl. 4—519 **5 Claims**

1. A hair washing basin for hairdressers, hospitals, private persons or the like comprising:

means defining a recess for the nape of the neck on the edge of the basin as well as an opening at the deepest location of the basin for evacuating the washing and rinsing water, the inside of the basin being provided with an obstacle limiting the flow path inside the basin which leads to an evacuation opening, said obstacle forming a wall and imparting a circular motion to the flowing water, said



obstacle extending in an open arc from the edge recess around the evacuation opening.

4,587,681

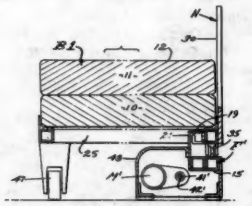
POWER OPERATED SEPARABLE BEDS AND SUPPORT THEREFOR

Mansour N. Mansouri, 1717 Sanysidro Dr., Beverly Hills, Calif. 91210; Masoud N. Mansouri, 1110 N. Bundy Dr., Los Angeles, Calif. 90049, and Kambiz Imani, 11667 Ohio Ave., Los Angeles, Calif. 90025

Division of Ser. No. 568,347, Jan. 5, 1984, Pat. No. 4,524,471. This application May 14, 1985, Ser. No. 733,884

Int. Cl.[4] A47C *19/00*

U.S. Cl. 5—8 **7 Claims**



1. A composite bedding unit comprised of two like and adjoining bed units and each having a head rail and foot rail and adapted to be juxtaposed to a median line in a primary double bed condition and to be separated from the median line to a secondary single bed condition, and including;

a transverse horizontally disposed guide track upstanding from a floor supported base at the head rail and extending substantially coextensively beneath the widths of the two single bed units when they are adjacently juxtaposed at the median line in said double bed condition,

laterally spaced support rollers carried by the head rail and engageable over the guide track to individually carry the head rail of each of the two single bed units for transverse movement to and away from each other,

a transverse downwardly disposed stabilizing track parallel with and overlying a portion of the guide track and ex-

tending from the median line a distance less than the extent of the guide track and substantially equal to the travel of the single bed units,

each bed unit having at least one stabilizing roller carried at the inner ends of the head rail to engage upwardly against the stabilizing tracks when the bed units are cantilevered,

a caster means at the foot rail of each of the two single bed units and engageable with the floor for transverse rolling support directly therewith,

and transport means for positioning the two single bed units by transverse movement into either of said primary double bed condition and single bed condition.

4,587,682

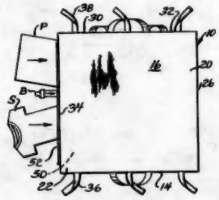
SLEEPING BAG

Dennis B. Schultz, 418 N. Van Buren, East Dundee, Ill. 60110

Filed Apr. 24, 1984, Ser. No. 603,338

Int. Cl.[4] A47G 9/08

U.S. Cl. 5—413 **34 Claims**



1. A sleeping bag, comprising:

first and second padded panels, with one of the panels overlying the other panel, said panels having a lower portion, an upper portion, and side edges;

first means for closing the side edges of the first and second panels, with the upper portion of said panels being inverted and tucked between an adjoining portion of said panels to define a pocket and an opening communicating with the pocket to receive and store articles; and

second means for closing said opening.

4,587,683

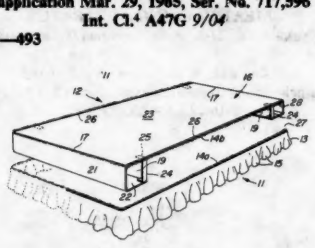
ZIP-ON ZIP-OFF DUST RUFFLE

Reginald Gardiner, 57 Long Dr., Hempstead, N.Y. 11550

Continuation of Ser. No. 570,588, Jan. 13, 1984, abandoned. This application Mar. 29, 1985, Ser. No. 717,596

Int. Cl.[4] A47G 9/04

U.S. Cl. 5—493 **2 Claims**



1. In combination with a rectangular box spring having a length and a width, cover means extending along the length of and on the top surface of said box spring and folded under the ends only of said box spring forming fold lines at the ends of said box spring extending the width thereof and leaving the sides of said box spring fully uncovered, said cover means covering completely the top surface of said box spring and having exposed side edges along the length of said box spring, means for retaining said cover means in place comprising elastic means engaged with said cover means along the sides of said box spring at each of the extremities of said cover member connected between the fold of said cover means under said box spring and the portion of said cover means located on the top surface of said box spring, said elastic means attached at both ends to said cover means on the side of the latter facing said box spring so that there is no exposed elastic means on either the top surface of said box spring or under said box spring and cover means, and dust ruffle means for protecting three sides of said box spring from the collection of dust including slide fastener means for attaching said dust ruffle means to said cover means along both exposed edges of said cover means along the lengths of said box spring and a fold line on said cover means along a width of said box spring, said dust ruffle consisting of a single continuous member extending along the aforesaid three sides of said box spring.

4,587,684

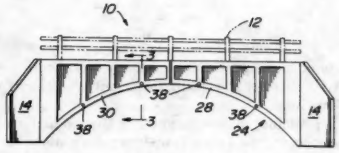
PRECAST CONCRETE BRIDGE

George R. Miller, Boyertown, Pa., assignor to Roman Arch and Culvert Corporation of America, Birdsboro, Pa.

Filed Oct. 14, 1983, Ser. No. 541,925

Int. Cl.[4] E01D 7/00, 19/00, 19/06, 19/12

U.S. Cl. 14—24 **12 Claims**



1. A bridge comprising a plurality of precast arcuate spans of reinforced concrete, said spans having arcuate top and bottom surfaces, said surfaces being uniformly spaced throughout a length of each said span, said spans disposed side by side between facia of reinforced concrete, said facia projecting upwardly to an elevation above the elevation of the crown of said spans, and a plurality of elongated rods or cables joining said spans to each other and to said facia.

4,587,685

WIPER ASSEMBLY FOR MOTOR VEHICLES

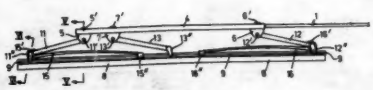
Jose Verton, Saint-Vincent, and Norbert Guerard, Virton, both of Belgium, assignors to Champion Spark Plug Europe S.A., Binche, Belgium

Filed Apr. 4, 1985, Ser. No. 720,492

Claims priority, application France, Apr. 11, 1984, 84 06700

Int. Cl.[4] B60S 1/32, 1/04

U.S. Cl. 15—250.42 **10 Claims**



1. A wiper assembly, in particular for motor vehicles, comprising a wiper arm of which one of the extremities is secured to a mounting head driven by a drive shaft and of which the portion opposed to the drive shaft is provided with two spaced apart hinges, and also comprising two rods which link said hinges to a wiping element by claws and by a pressure distributing profile, characterized in that:

(a) said two rods extend in opposed directions from their respective hinges towards the pressure distributing profile, and

(b) at their extremities opposed to their respective hinges

said two rods are each provided with a leaf spring of which the free end rests on the pressure distributing profile.

4,587,686

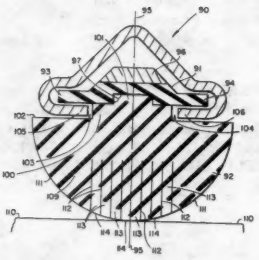
WINDSHIELD WIPER

William E. Thompson, R.R. 1, Box 89, Middletown, Ind. 47356

Continuation-in-part of Ser. No. 475,081, Mar. 14, 1983, Pat. No. 4,490,880. This application Aug. 15, 1984, Ser. No. 640,969

Int. Cl.[4] A47L *1/00*

U.S. Cl. 15—250.42 **9 Claims**



1. A windshield wiper insert suitably arranged for receipt by a windshield wiper superstructure, said windshield wiper insert comprising:

a wiper retainer member suitably designed and arranged for retained receipt by said superstructure; and

a unitary, part-cylindrical wiping element assembled to said wiper retainer member, said wiping element having a substantially flat surface and a convex curved surface wherein said curved surface being arranged with a plurality of substantially parallel wiping flaps which are defined by substantially parallel slits, said slits beginning at said curved surface and extending toward said substantially flat surface.

4,587,687

MOUNTING PIECE FOR SUCTION HOSE OF A CENTRAL VACUUM CLEANING SYSTEM

Alpo Ikonen, Muurame; Raimo Lehtolahti, Jyväskylä , and Reino Mustalampi, Muurame, all of Finland, assignors to Allaway Oy, Jyväskylä , Finland

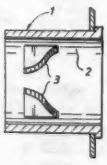
PCT No. PCT/FI84/00019, § 371 Date Nov. 2, 1984, § 102(e) Date Nov. 2, 1984, PCT Pub. No. WO84/03428, PCT Pub. Date Sep. 13, 1984

PCT Filed Feb. 21, 1984, Ser. No. 672,242

Claims priority, application Finland, Mar. 4, 1983, 830747

Int. Cl.[4] A47L *5/38*

U.S. Cl. 15—314 **9 Claims**



1. A mounting piece for a suction hose of a central vacuum cleaning system comprising suction piping (5) placed into floor and wall constructions of a building, said mounting piece (1) being made an integral part of a suction box (6), said suction box being rigidly connected to said suction piping (5) and comprising on the inner wall (2) of said mounting piece (1) at least one rib (3) pointing inwards from the inner walls and preventing objects that would clog said suction piping (5) from pivoting into said suction piping (5) and comprising on the inner wall (2) of said mounting piece (1) at least one rib (3) pointing inwards from the inner wall and preventing objects that would clog said suction piping (5) from getting into said suction piping (5), the surfaces of the rib or ribs that meet the flow being inclined toward the central axis of the mounting piece (1).

4,587,688

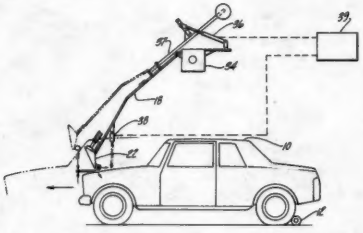
PROXIMITY DETECTOR SYSTEM FOR AUTOMATIC CAR WASHER/DRYER EQUIPMENT

Harry K. Gougoulas, 1875 Philomine, Lincoln Park, Mich. 48146

Filed Mar. 4, 1985, Ser. No. 707,753

Int. Cl.[4] B60S *3/06*

U.S. Cl. 15—316 R **9 Claims**



1. Vehicle surface treating apparatus such as a forced air water stripper comprising:

a treatment device such as an air nozzle which is to be maintained in proximity to a vehicle surface, support means for said device, power means for controlling the position of said support means thereby to maintain the device in a given proximity to said surface, and non-contacting proximity detector means carried by said support means, aimed at said surface and producing an output representing the distance between said detector and said surface, said output being connected to said control means; and means for maintaining a given aiming orientation between said detector and said surface.

4,587,689

MEAT PACKING APPARATUS

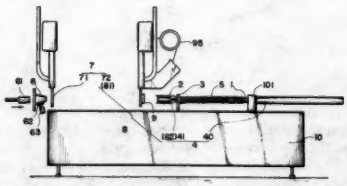
Minoru Nakamura, 27-6, Seta 1-chome, Setagaya-ku, Tokyo, Japan

Filed Jan. 9, 1984, Ser. No. 569,163

Claims priority, application Japan, Jan. 12, 1983, 58-2956

Int. Cl.[4] A22C *11/02*

U.S. Cl. 17—41 **11 Claims**



1. A meat packing apparatus for connecting a shirred casing to a nozzle and stuffing the casing with meat extruded from the nozzle, comprising:

shirred casing delivery means for connecting the shirred casing to the nozzle by advancing the shirred casing

toward the nozzle from a position forward of the direction in which meat is extruded from the nozzle, and for forming a portion of the shirred casing, which is located immediately rearward of the portion thereof connected to the nozzle, into a straight, tubular portion;

fastening means having a first fastening unit for closing and fastening an end of the straight, tubular portion of the shirred casing on the nozzle side of a meat mass stuffed into the straight, tubular portion from the nozzle, and a second fastening unit for closing and fastening the end of the straight, tubular portion of the shirred casing on the side of the meat mass opposite the nozzle;

shirred casing tensioning means having a constricting mechanism for constricting the diameter of the straight, tubular portion of the shirred casing on the side of the meat mass opposite the nozzle, and a withdrawal mechanism which cooperates with said constricting mechanism for pulling the straight, linear portion of the shirred casing backwardly in a direction away from the nozzle; and

cutting means for cutting the shirred casing at a position rearward of said second fastening unit;

said shirred casing delivery means including:

supporting means for supporting the shirred casing from the inner side thereof at a position forward of the direction in which the meat is extruded from the nozzle;

clamping means for holding the shirred casing at the end of the casing facing the nozzle, said clamping means including a movable portion being reversibly expandable within said casing, said movable portion when expanded holding said casing by pressing the shirred casing from the inner side thereof;

drive means for advancing said clamping toward the nozzle, said clamping means holding and advancing said casing, to connect said end of the shirred casing to the nozzle and for subsequently retracting said clamping means;

means for retaining said casing in said connected condition to said nozzle; and

resisting means for resistively engaging the wall of the shirred casing when said clamping means is moved in said advancing and retracting directions, and for, forming the shirred casing into the straight, tubular portion.

4,587,690

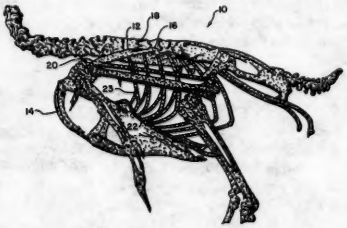
PROCESS FOR EVISCERATING AN AVIAN CARCASS

Jack L. Kress, Wilton, Iowa, assignor to Oscar Mayer Foods Corporation, Madison, Wis.

Filed Feb. 22, 1983, Ser. No. 468,536

Int. Cl.⁴ A22C *21/06*

U.S. Cl. 17—52 **15 Claims**



1. A method for eviscerating an avian carcass which comprises:

(a) removing a muscle part from the avian carcass and thereafter;

(b) severing a scapula or its articulation; and

(c) separating a coracoid associated with the severed scapula or its articulation from the vertebral column causing separation of the sternocostal articulations so that the separation is spaced away from the backbone wherein entrails are exposed for inspection.

4,587,691

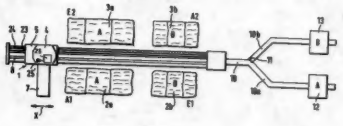
METHOD AND APPARATUS FOR FEEDING FIBER MATERIAL TO A PLURALITY OF FIBER PROCESSING MACHINES

Fritz Hösel, Monchen-Gladbach, Fed. Rep. of Germany, assignor to Trützschler GmbH & Co. KG, Monchen-Gladbach, Fed. Rep. of Germany

Filed Jan. 29, 1985, Ser. No. 696,056

Int. Cl.⁴ D01G *7/06*

U.S. Cl. 19—80 R **8 Claims**



1. A method of selectively supplying fiber material from an output of a fiber bale opener to a plurality of fiber processing lines each formed of a series of fiber processing machines, including the steps of removing fiber by the bale opener sequentially from bales of different fiber types; supplying predetermined fiber processing lines with predetermined types of fiber by the bale opener; the improvement comprising the steps of

(a) sensing a fiber quantity requirement of the fiber processing line while being supplied with fiber by the bale opener simultaneously performing fiber removal from the bales of a predetermined fiber type;

(b) interrupting the fiber removal at that location of the bale opener where it is situated when the fiber processing line then supplied with fiber, signals satisfaction of fiber requirement; and

(c) resuming fiber removal of said predetermined fiber type at said location upon a signal for fiber requirement by the fiber processing line supplied in step (a).

4,587,692

UNIVERSAL NAPKIN SUPPORT

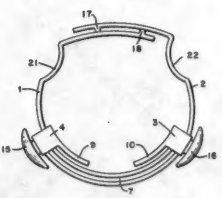
Milos Kaderabek, Raiffeisenstrasse 14a, 7 Stuttgart 31, Fed. Rep. of Germany

Filed Jul. 5, 1984, Ser. No. 627,767

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1983, 3324201

Int. Cl.⁴ A45F *5/04*

U.S. Cl. 24—9 **8 Claims**



1. A universal napkin support comprising two elastic about circular band arms corresponding in their shape about to the anatomical rounding of the human neck, and having one of their two ends free behind the neck;

sliding supports at corresponding one side ends of the band arms and provided with openings for allowing a sliding passage of the other respective band arm passing through and generating a variable interspace between the band

arms between the sliding supports for passage of a napkin followed by clamping of the napkin; and

protrusions disposed at one side of the inner wall providing horizontal grooves for rendering the sliding motion of the band arms more easy.

4,587,693

BUTTON

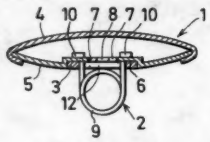
Kinzo Osumi, and Toshio Ozawa, both of Ohta, Japan, assignors to Osumi Metal Industry Co., Ltd., Oaza-Higashiyajima, Japan

Filed Sep. 13, 1985, Ser. No. 775,775

Claims priority, application Japan, Oct. 3, 1984, 59-149650[U]

Int. Cl.[4] A44B *1/18*

U.S. Cl. 24—111 2 Claims



1. A button of the type including a body of which bottom portion is formed with a recess or stepped part at the central area thereof, a fastening leg member made of resilient material, said fastening leg member having an opposing pair of end parts bent outwardly, and a holder with a slot formed therein through which the fastening leg member is inserted by manual force, wherein fitting of the fastening leg member to the body is achieved by way of the steps of fitting the holder onto the fastening leg member at the position as determined between the central part and the pair of end parts of the fastening leg member, inserting the pair of end parts of the fastening leg member through a slot on the bottom portion of the body, turning the fastening leg member within said slot and then causing the pair of end parts to be expanded in a pair of cutouts under the effect of expansive resilient force of the fastening leg member.

4,587,694

BOTTOM STOP FOR SLIDE FASTENERS

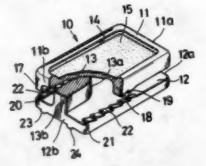
Sadaho Asahi, and Hiroo Minami, both of Uozu, Japan, assignors to Yoshida Kogyo K.K., Tokyo, Japan

Filed Dec. 6, 1983, Ser. No. 558,465

Claims priority, application Japan, Dec. 6, 1982, 57-184623[U]

Int. Cl.[4] A44B *19/36*

U.S. Cl. 24—435 2 Claims



1. A slide fastener bottom stop for attachment to a pair of stringer tapes thereof having coupling elements,

(a) a pair of first and second elongate plates spaced from each other in parallel relationship and receptive of the tapes therebetween, said first and second plates having longitudinally opposite ends;

(b) a connector post interconnecting said first and second plates at a transversely central position, said connector post having one end terminating short of one of said longitudinally opposite ends of each plate, and another end lying flush with the other opposite end of each plate, said one connector post end being abuttable by the endmost one of the interengaged coupling elements;

(c) said first and second plates each having longitudinal rows of sawteeth along longitudinal edges thereof facing each other, each of said sawteeth having a tooth face directed toward said other opposite end and a tooth back sloping downwardly toward said one of the opposite ends, each said row of sawteeth having a varying height progressively reducing toward said one opposite end; and

(d) one of said first and second plates having a pair of laterally spaced straight ridges disposed on a surface thereof remote from said sawteeth, one on each side of said connector post equidistantly therefrom, and extending longitudinally of said plate.

4,587,695

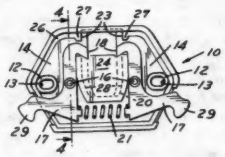
SNAP-IN LATCH MOUNTING BRACKETS

Kirk Jensen, Allen Park, Mich., assignor to Irvin Industries Inc., Rochester, Mich.

Filed Jan. 16, 1984, Ser. No. 571,083

Int. Cl.[4] A44B *11/25*

U.S. Cl. 24—634 7 Claims



1. Double latch release bracket for retaining passenger car cargo cover end cap comprising bracket housing means with a mounting perimeter for attachment to a rigid planar surface, said housing means including a face (**14**) parallel to and spaced from said mounting perimeter having an integral slotted end cap enclosure with an open entrance end slot (**22**) defined by back wall (**24**), side walls (**28**), and retaining lips (**25**) respectively formed in the bracket, said slot being provided in said face and extending within said retaining lips to accommodate an end cap extension through and normal to said face, a coplanar cavity within said housing extending around the side walls and under said end cap enclosure, a pair of pivoted latch levers within said cavity having facing hook end means to engage shoulders on either side of an end cap inserted within said enclosure, resilient means biasing said levers toward hook end closure end cap engagement, and manually actuable lever extension means (**29**) operably connected to the latch levers for overcoming said resilient bias to release said end cap.

4,587,696

BUCKLE FOR SEAT BELT

Takeo Ueda, Fujisawa, and Masaru Morinaga, Yamato, both of Japan, assignors to NSK Warner K. K., Tokyo, Japan

Filed Nov. 17, 1983, Ser. No. 552,694

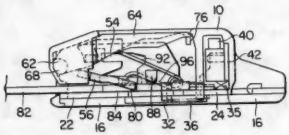
Claims priority, application Japan, Nov. 30, 1982, 57-179876[U]

Int. Cl.[4] A44B *11/26*

U.S. Cl. 24—637 9 Claims

1. A buckle for a seat belt including a latch piece pivotably connected to a buckle body, said latch piece having its midportion as the center of pivotal movement and having a latch portion at one end engageable with a tang when pivoted in a first direction and a release portion at an opposite end, a release button pivotably connected to said buckle body and having one end thereof as the center of pivotal movement, the release

portion of the latch piece being positioned between the center of pivotal movement of the latch piece and the center of pivotal movement of the release button, said center of pivotal movement of said release button being close to said release portion of said latch piece and remote from said latch portion of said latch piece, said release button being positioned relative to said latch piece so as to be engageable with said release



portion of said latch piece in the vicinity of said one end of said release button during pivotal movement thereof in the first direction to cause the latch piece to pivotally move in a second direction opposite to the first direction and release the engagement thereof with said tang, and biasing means for biasing said latch piece in the first direction and biasing said release button in the second direction.

4,587,697

AUTOMATIC TURRET LATHE

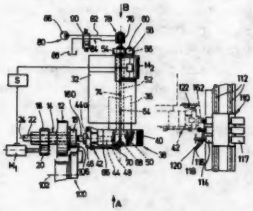
Helmut F. Link, Aichwald, and Walter Grossmann, Baltmannsweiler, both of Fed. Rep. of Germany, assignors to Index Werke Komm. Ges. Hahn & Tessky, Esslingen, Fed. Rep. of Germany

Filed Jun. 21, 1984, Ser. No. 622,942

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1983, 3323502

Int. Cl.[4] B23B *9/02*

U.S. Cl. 29—27 C **6 Claims**



1. An NC automatic turret lathe comprising a main spindle with a first chuck means rotatable about an axis of rotation; a first drive motor for driving said main spindle about said axis of rotation; a tool turret for machining a workpiece which is held in the first chuck means; a slide on which said turret is mounted for moving the tool turret along axes parallel and transverse to the axis of rotation of said main spindle; a second tool carrier having at least one tool receiving means; means for rotating each of said tool receiving means of said second tool carrier; said tool turret having a plurality of stations; at least one of said stations being equipped with an auxiliary spindle mounted on said turret for rotation about an auxiliary spindle axis in a forward and a reverse direction of rotation, and having a second chuck means; a second drive motor for driving said auxiliary spindle; sensor means for sensing the angle of rotation of the auxiliary spindle and operatively connected to and controlling said second drive motor; a rotatable locking device associated with said auxiliary spindle and comprising at least one stop surface corresponding to an angle of rotation of said auxiliary spindle and a reciprocally movable locking element disposed adjacent said stop surface for movement into an effective position in which it is in engagement with a stop surface of said locking device when urged in its reverse direction of rotation and locking said auxiliary spindle in a predetermined angular position; and means for actuating said locking element to move into engagement with a locking device stop surface and disposed in the path of movement of said tool turret; said locking device comprising a free-wheel mechanism in which said locking element is retained in engagement with a stop surface when it is in its effective position; said second drive motor comprising a reversible motor whereby the auxiliary spindle is fixedly angularly positioned by reversing said second drive motor for urging a desired stop surface of said locking device into engagement with said locking element after the locking element has been activated.

4,587,698

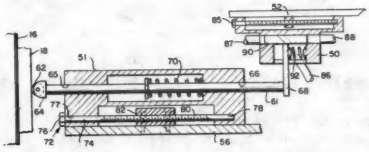
SCARFING METHOD AND APPARATUS

Stanley V. Bonner, Pottersville, N.J., and Frederic F. Baumann, Dansville, N.Y., assignors to Foster Wheeler Energy Corporation, Livingston, N.J.

Continuation of Ser. No. 368,059, Apr. 13, 1982. This application Feb. 27, 1985, Ser. No. 705,856

Int. Cl.[4] B23P *17/00*

U.S. Cl. 29—33 A **6 Claims**



1. Apparatus for removing excess weld material from an article having an elongated weld comprising:

means for moving the article in a direction parallel to the elongated weld,

a cutter for engaging the weld to remove excess weld material,

a fluid pressure cylinder connected to the cutter for moving the cutter into engagement with the weld,

sensing means engageable with the article for determining the position of the weld,

fluid pressure control means, responsive to the sensing means, for actuating the fluid cylinder to move the cutter into engagement with the weld in accordance with the determination by the sensing means of the position of the weld, said fluid pressure control means including a valve,

means for adjusting the position of said sensing means toward and away from the article, and

means for adjusting the starting position of said valve relative to said sensing means and toward and away from the article,

whereby the starting position of the sensing means relative to the article and the position of said valve relative to the sensing means may be adjusted.

4,587,699

ELASTIC DEVELOPER CARRIER

Yasuo Kadomatsu, Yokohama; Shoji Tajima, Higashikanamachi; Yoshio Miyazaki, Funabashi; Kimio Anze, Kawasaki, and Michikazu Sakurai, Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Japan

Filed Oct. 5, 1984, Ser. No. 658,197

Claims priority, application Japan, Oct. 6, 1983, 58-186026; Oct. 11, 1983, 58-188309

Int. Cl.[4] A01B *29/00*

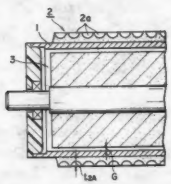
U.S. Cl. 29—121.1 **12 Claims**

1. A developer carrier for use in a developing device for developing a latent image by applying a film of developer as carried thereon, comprising:

an electrically conductive support;

a rubber magnet layer formed on said support to a first

predetermined thickness, said rubber magnet layer including a mixture of a rubber material and magnetic powder, and said rubber magnet layer being magnetized in alternating polarities at a predetermined pitch in a predetermined direction;



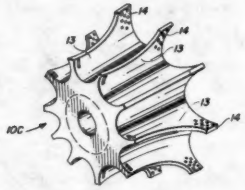
an electrode layer formed on said rubber magnet layer to a second predetermined thickness, said electrode layer including a layer of dielectric, adhesive agent formed on said rubber magnet layer and a plurality of electrode particles embedded in said adhesive agent layer as electrically isolated from one another and partly exposed at an outer surface of said electrode layer.

4,587,700

METHOD FOR MANUFACTURING A DUAL ALLOY COOLED TURBINE WHEEL

George Curbishley, Mesa, and George S. Hoppin, III, Scottsdale, both of Ariz., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed Jun. 8, 1984, Ser. No. 618,619
Int. Cl.[4] B21K *3/04;* **B23P** *15/04;* **B22F** *5/04;* **F01D** *5/00*
U.S. Cl. 29—156.8 R **27 Claims**



13. A method of manufacturing a cooled dual alloy turbine wheel having a hub portion and a plurality of thin blades projecting radially outwardly from said hub portion, said method comprising the steps of:

(a) producing a hollow cylinder of first superalloy material having high creep rupture strength, said hollow cylinder having an axial hole therein;

(b) filling said hole with second superalloy material having the properties of high tensile strength and high low-cycle-fatigue strength and permanently bonding said second superalloy material to said first superalloy material;

(c) slicing said cylinder into a plurality of relatively thin, precisely flat wafers;

(d) forming a plurality of cooling holes in each of said wafers at predetermined locations thereof;

(e) aligning and stacking said wafers and bonding said wafers into a laminated dual alloy cylinder with fluid cooling passages extending through blade locations in said laminated dual alloy cylinder whereat said thin blades are to be subsequently formed; and

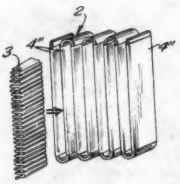
(f) machining said laminated dual alloy cylinder to produce said thin blades, said fluid cooling passages extending through various ones of said blades, respectively, to form said cooled dual alloy turbine wheel with blades having high creep rupture strength and with said hub having high low-cycle-fatigue and tensile strengths.

4,587,701

METHOD FOR PRODUCING AN ALUMINUM HEAT EXCHANGER

Mikio Koisuka, and Hisao Aoki, both of Gunma, Japan, assignors to Sanden Corporation, Gunma, Japan

Filed Aug. 27, 1984, Ser. No. 644,815
Claims priority, application Japan, Aug. 25, 1983, 58-130338
Int. Cl.[4] B21D *53/06*
U.S. Cl. 29—157.3 A **7 Claims**



1. In a method for producing an aluminum heat exchanger, wherein a flat aluminum tube is provided having at least one refrigerant passageway therein, said tube being formed into a serpentine-anfractuous shape in a longitudinal direction of said tube and characterized by a plurality of spaced parallel walls, into each space of which a corrugated aluminum metal fin unit is interposed, each brazed to corresponding parallel walls of said flat tube, the improvement which comprises:

providing said serpentine-anfractuous flat aluminum metal tube, said corrugated fin units of a first aluminum metal having a high aluminum content of 99 wt. % or more, and a plurality of U-shaped members of an aluminum alloy filler brazing metal;

closely fitting each of said U-shaped members of brazing metal between and onto said parallel walls of said flat tube, respectively;

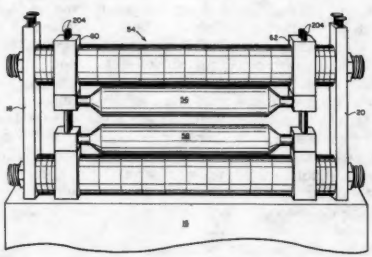
closely fitting said corrugated fin units in spaces within said U-shaped brazing members to form a heat exchanger assembly thereof; and heating said assembly to a brazing temperature to effect joining of said fin units and said flat tube and provide a coating layer of said brazing metal on an entire surface of said parallel walls of said flat tube.

4,587,702

METHOD FOR CONVERTING A STEEL SLITTER INTO A FOUR HIGH COLD REDUCTION MILL

Roger M. Kates, 1306 Blue Spring Rd., Princeton, N.J. 08540

Filed Jun. 4, 1984, Ser. No. 616,824
Int. Cl.[4] B23P *17/00*
U.S. Cl. 29—401.1 **2 Claims**



1. A method for converting a sheet metal slitting machine having a base, a drive motor means, and a slitter head including a pair of slitter arbors and an inboard and an outboard housing

for supporting said slitter arbors into a four-high cold reduction mill, comprising the steps of:

disconnecting said drive means from said slitter head;

removing said slitter head from said base;

installing a four-high cold reduction head including an inboard and an outboard housing and four rolls mounted in between said inboard and outboard housing; and,

connecting said drive means to said four-high cold reduction head.

4,587,703

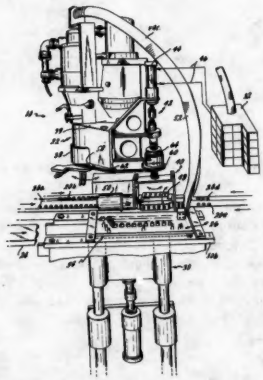
METHOD AND APPARATUS USING A MULTIFACETED TURRET FOR ROBOTIC ASSEMBLY

Sohiel Azizi, Irvine, and William Swan, Fullerton, both of Calif., assignors to Apple Computer, Inc., Garden Grove, Calif.

Filed Jan. 16, 1985, Ser. No. 692,647

Int. Cl.[4] B23P *11/00, 21/00;* **B65G** *47/26;* **B25J** *15/06*

U.S. Cl. 29—431 **20 Claims**



1. A robotic system for assembling a multiplicity of parts, said multiplicity of parts characterized by a plurality of distinct types, said parts disposed in a pick-up position and assembled in an assembly position spaced apart from said pick-up position, said system comprising:

a programmable robot with an arm;

a multifaceted turret, each facet of said turret arranged and configured to manipulate at least one of said plurality of said types of parts;

means for rotating said turret to selectively orient one of said facets of said turret in a predetermined orientation;

means for vertically moving said turret; and

control means coupled to said robotic arm, to said means for rotating and to said means for advancing for controlling each according to a predetermined program,

whereby said system is capable of assembling a multiplicity of parts of a plurality of types while moving only once between said pick-up position where said parts are picked up and said assembly position where said parts are assembled.

6. A improvement in a robotics system for assembling a multiplicity of parts, said multiplicity of parts characterized by a plurality of types, said robotic system including a corresponding plurality of hoppers for arranging said multiplicity of parts of each type in a pick-up position in a predetermined orientation, a conveyor mechanism for transporting and selectively retaining a workpiece to which said multiplicity of parts are to be assembled at an assembly position, a robotic arm for moving said multiplicity of parts from said pick-up position to said assembly position, a controller for timing and controlling movement of said robotic arm, said improvement comprising;

a rotatable multifaceted turret coupled to said robotic arm, each facet of said turret including a member arranged and configured to mate with one of said plurality of types of said parts and to temporarily retain said part on said facet; and

means for selectively rotating said turret to orient each facet of said turret in a predetermined orientation,

whereby a multiplicity of said parts of said plurality types may be temporarily retained on said turret when in said pick-up position, moved to said assembly position and assembled on said workpiece with a single movement of said robotic arm between said pick-up position and assembly position.

11. A method for assembling a multiplicity of parts on a workpiece, said multiplicity of parts comprised of a plurality of characteristic types, said method comprising the step of:

disposing said parts in a pick-up position, said parts segregated in said pick-up position by said type of said part;

picking up at least one part of said plurality of types of said parts in said pick-up position with a rotatable multifaceted turret mounted on a robotic arm;

moving said turret from said pick-up position to an assembly position in a single motion between said two positions;

installing said parts on said turret onto said workpiece when in said assembly position,

whereby robotic assembly time required for assembly of a multiplicity of parts of a plurality of types is substantially decreased.

17. A improvement in a method of assembling a multiplicity of parts of a plurality of distinguishable types on to a workpiece comprising the steps of:

loading a rotatable multifaceted turret with a multiplicity of parts of said plurality of distinguishable types when in a pick-up position;

moving said turret from a pick-up position to an assembly position, said workpiece disposed at said assembly position;

installing said multiplicity of parts of said plurality of types of said workpiece when in said assembly position; and

moving said turret from said assembly position in a single motion back to said pick-up position,

whereby operational cycles of robotic assembly of a multiplicity of parts of a plurality of types is substantially decreased.

4,587,704

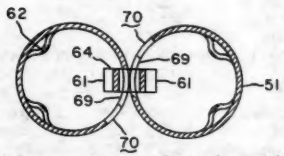
METHOD OF MOUNTING A CONTINUOUS LOOP SPRING ON A NUCLEAR FUEL SPACER

Bruce Matzner; Victor M. Horn; Michael V. Curulla, all of San Jose, Calif., and John F. Price, Wilmington, N.C., assignors to General Electric Company, San Jose, Calif.

Division of Ser. No. 410,124, Aug. 20, 1982, Pat. No. 4,508,679. This application May 7, 1984, Ser. No. 607,745

Int. Cl.[4] B23P *11/02*

U.S. Cl. 29—446 **1 Claim**



1. A method for mounting a continuous loop spring on the adjacent walls of a pair of ferrules of a ferrule type spacer for the elongated elements of a nuclear reactor fuel bundle, comprising the steps of:

(a) forming a C-shaped cutout in the wall of one of said ferrules to provide a tab for receiving said spring;

(b) forming a C-shaped cutout in the wall of the other of

said pair of ferrules to provide a tab facing opposite to the tab of said one of said ferrules;

(c) inserting the tabs of said pair of ferrules through said spring and adjusting the position of said ferrules so that the tabs thereof extend in opposite directions through said spring and are in overlapping position; and

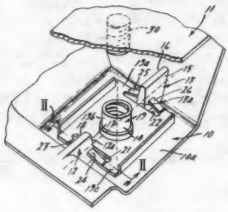
(d) securing the ferrules of said pair together to maintain said position.

4,587,705

METHOD OF JOINING A MOLDED FIRST PART TO A MATING PART CARRYING A FIRST THREAD MEMBER

George E. Ruck, Woodhaven, and Michael H. Stefani, Livonia, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Nov. 9, 1984, Ser. No. 670,108
Int. Cl.[4] B23P *11/02*
U.S. Cl. 29—450 6 Claims



1. A method of joining a molded first part to a mating part carrying a first threaded member, the steps comprising:

(a) molding said first part to have integral ribs projecting outwardly from one side thereof having shoulders spaced apart along a loading axis, each rib having a pair of planar surfaces aligned with said loading axis;

(b) forming an element with a complimentary threaded member and with a supporting base plate, said base plate having opposed shoulders adapted to mate and engage at least one shoulder of each of said ribs to transfer transverse loads therebetween, said plate also having at least one pair of opposed fingers projecting therefrom, toward each other, with the spacing between the tips of within a pair said fingers within a pair being less than the thickness of said ribs, whereby said at least one pair of fingers is effective to be resiliently sprung to engage with a pair of said planar surfaces permitting movement of the fingers therealong in one direction but preventing movement in an opposite direction;

(c) forcing said element over said ribs to wedge said at least one pair of fingers onto the planar surfaces of said ribs and mating said shoulders of said plate and ribs; and

(d) fitting said mating part to said first molded part and fixedly engaging the threaded members carried by each of said parts so that loads may be transferred transversely between said parts.

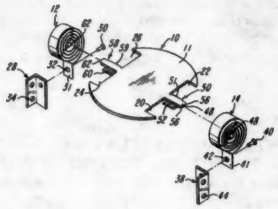
4,587,706

THERMALLY RESPONSIVE DAMPER ASSEMBLY HAVING INTERFITTING PARTS AND METHOD

John Prikkel, III, Dayton, and Dale R. Booher, Fairborn, both of Ohio, assignors to Energy Vent, Inc., Dayton, Ohio

Division of Ser. No. 134,308, Mar. 26, 1980, abandoned. This application Feb. 27, 1985, Ser. No. 706,148
Int. Cl.[4] B21D *39/00;* G05D *23/00*
U.S. Cl. 29—513 2 Claims

1. The method of forming a damper assembly for fitting within a duct comprising the steps of stamping and bending a sheet metal plate for fitting within said duct, and for providing peripheral notches in said plate and folded arms integral with said plate and located in said notches, said folded arms each projecting coplanarly from said plate and each having an underlying flange joined to the arm by means of a crease located at one edge of the arm, spirally convoluting bimetallic



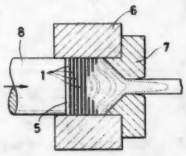
coil elements, bending the innermost convolution of each of said coil elements to form a tongue traversing such innermost convolution, and sliding said tongues into said folded arms.

4,587,707

METHOD FOR MANUFACTURE OF COMPOSITE MATERIAL CONTAINING DISPERSED PARTICLES

Yoshinori Nishida, Kasugai; Tsunemichi Imai, Nagoya, and Hiromi Matsubara, Aichi, all of Japan, assignors to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

Filed Feb. 25, 1983, Ser. No. 469,693
Claims priority, application Japan, Mar. 29, 1982, 57-50869
Int. Cl.[4] B22D *23/06;* B22F *3/24*
U.S. Cl. 29—527.7 5 Claims



1. A method for the manufacture of a composite material containing dispersed ceramic particles, comprising the steps of:

preparing porous shaped articles of ceramic particles by mixing ceramic particles with a binder, compression molding the resultant mixture and sintering the compression molded mixture, thereby expelling said binder from the mixture by combustion,

disposing said porous shaped articles formed of ceramic particles with a mold,

pouring a molten metal into said mold, then applying high pressure to bear upon said molten metal, thereby causing said molten metal to be thoroughly penetrated into the pores distributed within said porous shaped articles of ceramic particles,

allowing said molten metal to solidify, thereby giving rise to a solid composite incorporating therein the shaped articles of ceramic particles, and

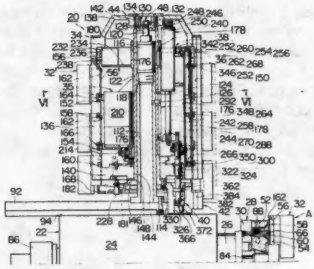
subjecting said solid composite to a plasticizing treatment, thereby breaking up the shaped articles of ceramic particles and allowing the ceramic particles to be dispersed in the metal.

4,587,708

CHUCK JAW CHANGER FOR A MACHINE TOOL

Chihiro Miyachi, Nagoya, Japan, assignor to Howa Kogyo Kabushiki Kaisha and Kabushiki Kaisha Yamazaki Tekkosho, both of Aichi, Japan

Filed May 11, 1984, Ser. No. 609,202
Claims priority, application Japan, May 18, 1983, 58-88050
Int. Cl.[4] B23Q 3/155
U.S. Cl. 29—568 19 Claims



1. A chuck jaw changer for use with a work spindle (22) having a work spindle (26), said jaw changer operable with a plurality of interchangeable sets of gripping jaws (32, 32'), comprising:

(a) a chuck (28) having a chuck body (30) adapted to be mounted on the work spindle (26) of the machine tool, the chuck body having a plurality of jaw guideways (54) arranged radially of the work spindle for replaceably receiving a set of slidable gripping jaws (32) for chucking and unchucking work, each gripping jaw being slid into and out of one of the jaw guideways in a radial direction of the work spindle when that jaw guideway is in a preassigned first jaw change position on the work spindle;

(b) a jaw magazine (34) in the form of a hollow cylinder adapted to be mounted on the machine tool and being rotatable relative thereto about an axis oriented radially of the work spindle of the machine tool, said jaw magazine having a plurality of jaw grooves (150) at circumferential spacings in said hollow cylinder, each jaw groove adapted to receive an additional set of gripping jaws (32') or the first recited set of gripping jaws (32), as the latter are withdrawn from the chuck body, said gripping jaws releasably engaged in said grooves and in alignment;

(c) an indexing mechanism (35) disposed internally of said cylindrical jaw magazine (34) for moving the jaw magazine relative to the machine tool so as to bring any one of the jaw grooves, with or without a set of gripping jaws engaged therein, to a preassigned second jaw change position where the jaw groove is in line with that one of the jaw guideways in the chuck body which is in the first jaw change position, the aligned gripping jaws in the first jaw change position and in the second jaw change position being held at constant pitch distances; and

(d) a jaw transfer mechanism (36) disposed internally of said cylindrical jaw magazine (34) and movable between the chuck and the jaw magazine a distance equal to the pitch distance between the gripping jaws aligned in the first and second jaw change positions, the jaw transfer mechanism being capable of simultaneously engaging the set of gripping jaws being held in the jaw groove in the second jaw change position for transferring the same into the successive jaw guideways being held in the first jaw change position, the jaw transfer mechanism being further capable of engaging the gripping jaw being held in the jaw guideway in the first jaw change position for transferring the same into the jaw groove in the second jaw change position;

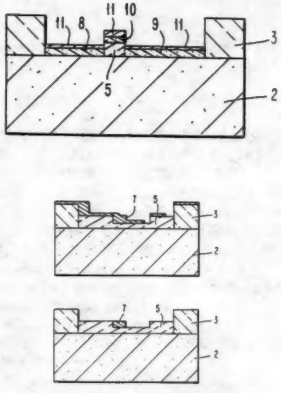
(e) whereby each complete set of gripping jaws can be transferred from the chuck body to the jaw magazine, or vice versa, while the jaw magazine is standing still on the machine tool with one of the jaw grooves held in the second jaw change position.

4,587,709

METHOD OF MAKING SHORT CHANNEL IGFET

Alan B. Fowler, Yorktown Heights, and Allan M. Hartstein, Chappaqua, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 6, 1983, Ser. No. 501,463
Int. Cl.[4] H01L 21/76, 21/302, 21/225
U.S. Cl. 29—571 17 Claims



1. A process for fabricating a self-aligned gate field effect transistor which comprises:

a. providing a vertical step in an isolation material on a semiconductor substrate;

b. edge depositing metal against said vertical step by evaporating the metal at an angle sufficient to provide a thicker metal deposit adjacent to said step than over said surface.

c. etching away said isolation material to the substrate, except where masked by said metal, thereby producing an isolation material mesa; and

d. depositing source, drain, and gate defining material on the horizontal surfaces at both sides of said mesa and at the top of said mesa.

4,587,710

METHOD OF FABRICATING A SCHOTTKY BARRIER FIELD EFFECT TRANSISTOR

Kuey-Yeou Tsao, Barrington, Ill., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Jun. 15, 1984, Ser. No. 621,282
Int. Cl.[4] H01L 21/26; B05D 3/06
U.S. Cl. 29—571 12 Claims

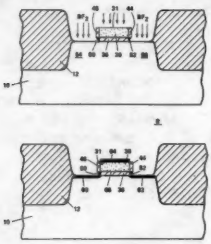
1. A method of making a Schottky barrier field effect transistor, said method comprising the steps of:

(a) providing a substrate of single crystal silicon having a surface defining drain and source regions;

(b) forming a polysilicon gate chip having top, bottom and sidewall surfaces disposed adjacent said drain and source regions and spaced from said substrate surface by a silicon dioxide chip interposed between said bottom gate chip surface and said substrate surface; and

(c) depositing on said drain and source drain region surfaces and on said gate top surface without depositing on said

interposed silicon dioxide chip a metal selected from the group consisting of tungsten and molybdenum such that



said metal deposited on said drain and source region surfaces extends underneath the sidewall edges of said gate.

4,587,711

PROCESS FOR HIGH DENSITY VLSI CIRCUITS, HAVING SELF-ALIGNED GATES AND CONTACTS FOR FET DEVICES AND CONDUCTING LINES

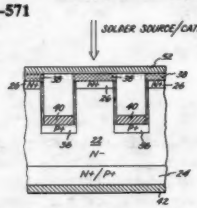
Gordon C. Godejahn, Jr., Santa Ana, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Division of Ser. No. 242,441, Mar. 11, 1981, abandoned, which is a division of Ser. No. 909,886, May 26, 1978, Pat. No. 4,277,881. This application Aug. 6, 1984, Ser. No. 638,153

The portion of the term of this patent subsequent to Jul. 14, 1998, has been disclaimed.

Int. Cl.[4] H01L *21/90*

U.S. Cl. 29—571 **8 Claims**



1. A process for fabricating very large scale integrated circuits including field effect semiconductor devices and conducting lines on a monocrystalline silicon semiconductor substrate having a first surface on which said integrated circuits are to be formed, comprising the steps of:

forming a field oxide on said first surface surrounding and isolating selected areas of said first surface on which respectively corresponding active devices are to be formed,

thermally growing a silicon dioxide layer on said selected areas of said first surface, of a thickness suitable for the gate insulator layer of an active device,

forming a silicon nitride layer on said silicon dioxide layer extending at least over said selected areas,

depositing a layer of doped polysilicon on said nitride layer,

delineating said polysilicon layer to define a gate polysilicon layer extending transversely of said selected area for each said active device and to define polysilicon conducting lines on said field oxide, and removing remaining portions of the polysilicon layer, said gate polysilicon layer defining first and second, remaining portions of said selected area corresponding to source and drain regions of each said active device,

oxidizing the surfaces of said gate polysilicon layer and of said polysilicon conducting lines while retaining the silicon nitride layer over said source and drain regions of each active device to prevent the formation of any substantial amount of thermal oxide on said source and drain regions,

implanting dopant into the substrate through said first surface adjacent to the gate polysilicon layer to form a source and drain for each semiconductor device,

removing exposed portions of the silicon nitride layer by a material selective removal process, thereby to expose the underlying silicon dioxide layer on said sources and drains,

removing a portion of the oxide layer thermally formed on said polysilicon conducting lines to expose the underlying polysilicon thereof, and define at least one electrical contact surface thereof;

removing the silicon dioxide layer uncovered by removal of the portions of the nitride layer, thereby to expose the surface of said substrate at said sources and drains of at least selected ones of said active devices thereby to permit forming of self-aligned contacts to said sources and drains of said selected active devices and to said contact surface of the polysilicon conducting line and,

forming contacts to said sources and drains and to the contact surface of said line.

4,587,712

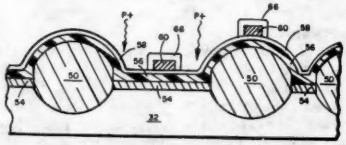
METHOD FOR MAKING VERTICAL CHANNEL FIELD CONTROLLED DEVICE EMPLOYING A RECESSED GATE STRUCTURE

Bantval J. Baliga, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 324,299, Nov. 23, 1981, abandoned. This application Jan. 17, 1985, Ser. No. 692,073

Int. Cl.[4] H01L *21/20*

U.S. Cl. 29—571 **21 Claims**



1. A method of fabricating a vertical channel junction gate electric field device having a recessed gate structure and being of the type including a semiconductor base region of one conductivity type and a gate region of opposite conductivity type, said method comprising:

providing a semiconductor wafer having a base layer of the one conductivity type;

forming an electrode layer of one conductivity type atop the base layer;

forming grooves through said electrode layer and extending into the base layer, such that said grooves divide said upper electrode layer into upper electrode regions between said grooves;

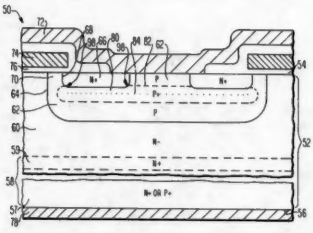
partially refilling said grooves to thereby form junction gate regions of opposite conductivity type recessed in said grooves; and

depositing metal onto the wafer surface to form metallized electrode terminals in ohmic contact with the upper electrode region, and metallized recessed gate terminals in ohmic contact with the junction gate regions recessed in the grooves.

4,587,713
METHOD FOR MAKING VERTICAL MOSFET WITH REDUCED BIPOLAR EFFECTS

Lawrence A. Goodman, Plainsboro, and Alvin M. Goodman, Princeton Township, Mercer County, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Feb. 22, 1984, Ser. No. 582,601
Int. Cl.[4] H01L *29/78*
U.S. Cl. 29—576 B 7 Claims



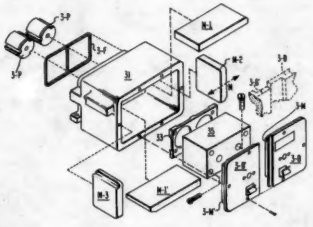
1. In a method for fabricating a VDMOS device including the steps of providing a semiconductor wafer having a drain region of first conductivity type adjacent to a surface thereof, forming an apertured mask on said surface, diffusing a second conductivity type dopant into the wafer through a mask aperture so as to form a body region and a body/drain PN junction, and diffusing a first conductivity type dopant into the wafer through said mask aperture so as to form a source region and a source/body PN junction, the source/body PN junction extending to a predetermined depth from said wafer surface and being spaced from the body/drain PN junction so as to define a channel region at said surface, the improvement comprising:

implanting a supplementary dopant of second conductivity type into the wafer through said aperture, and subsequently annealing said wafer, so as to create a supplementary region of relatively high areal dopant concentration; said supplementary region extending beneath at least a portion of said channel region.

4,587,714
MANUFACTURE OF MOTOR WITH SPLIT BACK MAGNET ARRAY

Frank I. Morris, San Jose, Calif., assignor to Memorex Corporation, Santa Clara, Calif.

Division of Ser. No. 512,876, Jul. 12, 1983. This application Jan. 3, 1984, Ser. No. 567,728
Int. Cl.[4] H04R *31/00*
U.S. Cl. 29—594 15 Claims



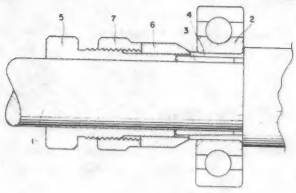
1. A method of fabricating an improve actuator motor for a disc drive actuator, this motor including magnet means, the magnet means comprising a slab of ferro-magnetic ceramic; the method including:

splitting this slab at least once to form an array of identical magnet parts.

4,587,715
MOUNTING TOOL

Stig L. Hallerbäck, 421 74 Västra Frölunda, Sweden, assignor to Aktiebolaget SKF, Gotebort, Sweden

Filed Jan. 30, 1984, Ser. No. 574,745
Claims priority, application Sweden, Mar. 7, 1983, 8301218
Int. Cl.[4] B25B *27/02*
U.S. Cl. 29—525 3 Claims

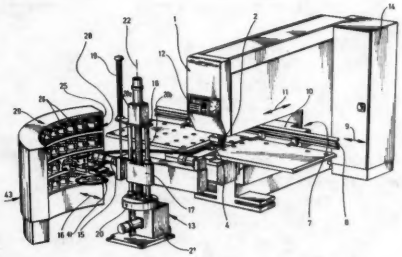


1. A method for mounting a bearing assembly including inner and outer spaced rings and a plurality of rolling elements in the annular space between the rings on a shaft member by means of a pair of tapered sleeve members actuatable axially relative to one another to exert a predetermined radial seating force on the inner ring of the bearing assembly consisting of the steps of moving a mounting sleeve axially relative to the shaft to engage one of the sleeve members to effect axial displacement of said one sleeve member until a radial expansion of the inner ring is just ready to begin, engaging the other sleeve member with a spacing ring backing off the spacing ring relative to the other sleeve member a predetermined distance calculated to produce a predetermined expansion of the inner ring and then moving the mounting sleeve axially to effect further relative axial displacement of said one sleeve member until the spacing ring again contacts the other sleeve member.

4,587,716
MACHINE TOOL CENTER WITH MULTIPURPOSE ROBOT ASSEMBLY FOR LOADING AND UNLOADING TOOLING AND WORKPIECES FROM MACHINE TOOL

Peter Bytow, Simmozheim, Fed. Rep. of Germany, assignor to Trumpf GmbH & Co., Ditzingen, Fed. Rep. of Germany

Filed Jun. 7, 1984, Ser. No. 618,206
Claims priority, application Fed. Rep. of Germany, Jun. 9, 1983, 3320762
Int. Cl.[4] B23G *3/155*
U.S. Cl. 29—568 10 Claims



1. In a machine tool center having (1) a machine tool for performing work upon a workpiece and having a work support station and at least one tool mounting station, (2) a tool storage magazine spaced from said machine tool and having a multiplicity of tool storage positions having stored therein tool

members with grippable elements thereon, and (3) a workpiece storage area spaced from said machine tool, the combination therewith of:

(A) a robot assembly for inserting and removing tools from said magazine and said tool mounting station and transporting them therebetween, and for moving workpieces between said work support station and said workpiece storage area; and

(B) a control system for controlling the operation of said robot and of said machine tool, said robot assembly having:

(i) a base;

(ii) a body movable on said base at least about a vertical axis;

(iii) a telescoping arm extending horizontally from said body, said arm being variable in length by telescoping movement thereof;

(iv) gripping means pivotably supported intermediate its length at the outer end of said arm for pivotal movement about a vertical axis and including gripping elements at each end thereof;

(v) workpiece engageable means adapted to engage workpieces for movement between said work support station and said workpiece storage area, said workpiece engageable means having grippable elements thereon, each of said gripping elements of said gripping means being configured and dimensioned to grip said grippable elements of said tool members and of said workpiece engageable means; and

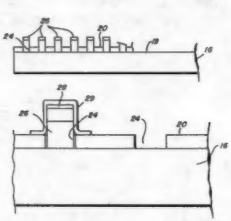
(vi) drive means for effecting movement of said body on said base, telescoping movement of said arm, and movement of said gripping means to grip and release said tool members and said workpiece engageable means, said drive means being controlled by said control means.

4,587,717

LED PRINTING ARRAY FABRICATION METHOD

Joseph J. Daniele, Pittsford, and Mehdi N. Araghi, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 2, 1985, Ser. No. 729,707
Int. Cl.[4] H01L 7/36
U.S. Cl. 29—569 L **10 Claims**



1. A method for forming a Light Emitting Diode (LED) for combination with one or more like LEDs to form a solid state Full Width Array (FWA) Light Emitting Diode (LED) write bar, comprising the steps of:

(a) coating one surface of a silicon chip with Silicon Dioxide to form a thin film layer;

(b) opening an array of holes of predetermined size and pattern in said layer;

(c) growing Gallium Phosphide (GaP) LEDs including p-n junctions and contact layer in said holes; and

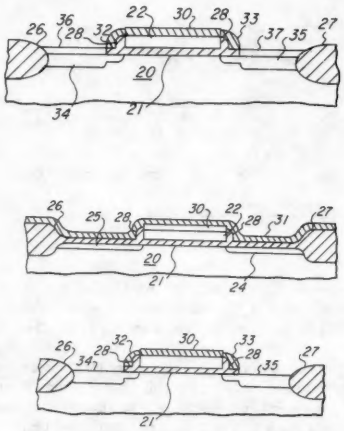
(d) fabricating control circuitry for said LEDs on the remainder of said chip.

4,587,718

PROCESS FOR FORMING $TiSi_2$ LAYERS OF DIFFERING THICKNESSES IN A SINGLE INTEGRATED CIRCUIT

Roger A. Haken, Richardson, Tex.; Michael E. Alperin, Green Mountain Falls, Colo., and Chi K. Lau, Saratoga, Calif., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 30, 1984, Ser. No. 676,686
Int. Cl.[4] H01L 21/285
U.S. Cl. 29—571 **18 Claims**



11. A process for forming refractory metal silicide layers in both the polycrystalline silicon layer and the substrate of an integrated circuit, wherein the thickness of the layer of refractory metal silicide in said polycrystalline silicon layer is different from the thickness of the refractory metal silicide layer in said substrate, comprising the steps of:

forming a first layer of silicon dioxide on said substrate;

forming a layer of polycrystalline silicon on said first layer of silicon dioxide;

forming a layer of silicon nitride on said layer of polycrystalline silicon;

patterning said layer of polycrystalline silicon and said layer of silicon nitride to the same pattern, thus providing a patterned layer of polycrystalline silicon having a layer of silicon nitride on the surface thereof;

forming a second layer of silicon dioxide on the exposed sidewalls of said patterned layer of polycrystalline silicone;

removing said patterned layer of silicon nitride;

forming a first layer of refractory metal on said integrated circuit;

baking said integrated circuit thus causing said layer of refractory metal to react with the surface of said patterned layer of polycrystalline silicon to form refractory metal silicide;

removing the unreacted portion of said layer of refractory metal;

forming a third layer of silicon dioxide on said integrated circuit; removing a portion of said third layer of silicon dioxide and said first layer of silicon dioxide so that silicon dioxide remains on the sidewalls of said patterned polycrystalline silicon layer and on those areas of said integrated circuit which will not receive a layer of refractory metal silicide;

forming a second layer of refractory metal on said integrated circuit;

baking said integrated circuit thus causing said second layer of refractory metal to react with the areas of said substrate and said polycrystalline silicon areas not covered by the

remaining portion of said third layer of silicon dioxide and said first layer of silicon dioxide; and

removing the unreacted portion of said second layer of refractory metal.

17. A process for forming refractory metal silicide layers in both the polycrystalline silicon gate and the source and drain regions of a field effect transistor, wherein the thickness of the layer of refractory metal silicide in said polycrystalline silicon gate is different from the thickness of the refractory metal silicide layer in said source and drain regions, comprising the steps of:

forming a first layer of silicon dioxide on said substrate;

forming a layer of polycrystalline silicon on said first layer of silicon dioxide;

forming a layer of silicon nitride on said layer of polycrystalline silicon;

patterning said layer of polycrystalline silicon and said layer of silicon nitride to the same pattern, thus providing a patterned gate of polycrystalline silicon having a layer of silicon nitride on the surface thereof;

forming a second layer of silicon dioxide on the exposed sidewalls of said patterned gate of polycrystalline silicon;

forming a field oxide surrounding the area of said substrate in which said field effect transistor wil be formed;

removing said patterned layer of silicon nitride; forming a first layer of refractory metal on said integrated circuit;

baking said integrated circuit thus causing said layer of refractory metal to react with the surface of said patterned layer of polycrystalline silicon to form refractory metal silicide;

removing the unreacted portion of said layer of refractory metal;

removing a portion of said first and second layers of silicon dioxide so that silicon dioxide remains on the sidewalls of said patterned polycrystalline silicon layer and on those areas of said integrated circuit which will not receive a layer of refractory metal silicide;

implanting and driving in dopant ions into said substrate to form said source and said drain regions;

forming a second layer of refractory metal on said integrated circuit;

baking said integrated circuit thus causing said second layer of refractory metal to react with said gate, source and drain regions; and

removing the remaining portions of said second layer of refractory metal.

4,587,719

METHOD OF FABRICATION OF LONG ARRAYS USING A SHORT SUBSTRATE

Phillip W. Barth, Palo Alto, Calif., assignor to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Continuation-in-part of Ser. No. 518,931, Aug. 1, 1983. This application Jun. 5, 1984, Ser. No. 617,304

Int. Cl.⁴ H01L *21/90*

U.S. Cl. 29—577 C **15 Claims**

1. A method of forming a flexible array of circuit elements and electrical contacts interconnected by continuous wires, comprising the steps of

(a) providing a body of semiconductor material having opposed major surfaces,

(b) forming a plurality of said circuit elements on first major surface of said body,

(c) providing conductive interconnections on said first major surface to interconnect said circuit elements, said conductive interconnections forming two or more substantially parallel, substantially linear regions, such regions connected at their ends by shorter regions substantially perpendicular to said parallel regions in such a manner as to form a continuous meandering path,

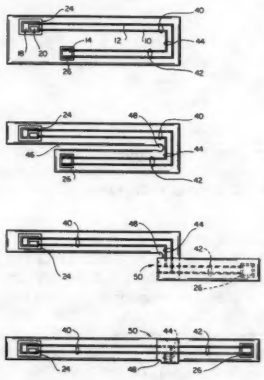
(d) attaching a flexible polymer layer to said conductive interconnections and said first major surface,

(e) providing an opening or openings in said polymer layer to allow contact to said conductive interconnections,

(f) removing portions of said body of semiconductor material by etching, leaving separated islands of semiconductor material supported by said polymer layer,

(g) attaching an additional polymer layer over the second major surface of said islands and polymer, forming a resulting layer of polymer which encases said islands

(h) cutting said resulting polymer layer between and substantially parallel to said parallel regions, but not through said perpendicular regions,



(i) folding the said resulting polymer layer through an angle of approximately 180° about an axis perpendicular to said parallel regions, where such fold point is at or near the juncture of said perpendicular region with one of said parallel regions, and then

(j) folding the said resulting polymer layer through an angle of approximately 180° about an axis parallel to said parallel regions, where such fold point is at or near the juncture of said perpendicular region with the other adjacent parallel region, and

(k) fastening said resulting shape to make it retain its folded shape.

4,587,720

PROCESS FOR THE MANUFACTURE OF A SELF-ALIGNED THIN-FILM TRANSISTOR

André Chenevas-Paule, Grenoble, and Bernard Diem, Meylan, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Oct. 10, 1984, Ser. No. 659,316

Claims priority, application France, Oct. 12, 1983, 83 16203

Int. Cl.⁴ H01L *21/324, 21/265*

U.S. Cl. 29—578 **5 Claims**

1. Process for producing a thin-film self-aligned grid transistor, comprising the following steps:

(a) forming the grid of the transistor on a glass substrate;

(b) depositing an insulating layer on the substrate and a gate;

(c) depositing a layer of hydrogenated amorphous silicon on said insulating layer in an amount sufficient to provide a thickness of from about 150 to 300 namometers;

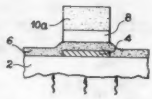
(d) depositing on said silicon layer a layer positive photosensitive resin sensitive to light and having a wavelength greater than 550 nanometers;

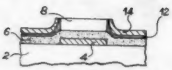
(e) irradiating said resin layer through said substrate, the gate serving as a mask for the irradiation;

(f) developing the resin layer leading to the elimination of the irradiated zones of the said resin layer;

(g) etching said silicon layer until said insulating layer is laid

bare, the residual resin serving as a mask for the said etching;





(h) connecting the electrical contacts and the electrodes of the source and drain of the transistor; and

(i) eliminating the residual resin.

4,587,721

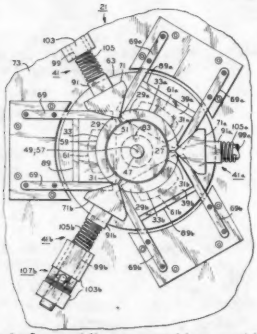
METHOD OF ASSEMBLING A ROTATABLE ASSEMBLY, APPARATUS AND METHOD OF OPERATING SUCH

Alexander Muller, Holland, Mich., assignor to General Electric Company, Fort Wayne, Ind.

Continuation-in-part of Ser. No. 616,200, Jun. 1, 1984, which is a continuation-in-part of Ser. No. 593,840, Mar. 27, 1984. This application Jul. 13, 1984, Ser. No. 630,872

Int. Cl.[4] H02K *15/02*

U.S. Cl. 29—596 **44 Claims**



2. A method of assembling a rotatable assembly including at least one rotatable member having a circumferential surface, and a set of generally arcuate magnet material elements each having a pair of generally opposite marginal edges defining the arcuate length of the magnet material element within preselected tolerance limits and with the arcuate length of at least one of the magnet material elements being different than that of at least another of the magnet material elements within the preselected tolerance limits, the method comprising the steps of:

arranging the at least one rotatable member in a preseslected position;

moving the magnet material elements toward assembly positions with the arcuate lengths thereof extending generally circumferentially about the circumferential surface of the at least one rotatable member in its preselected position and locating the opposite marginal edges of the magnet material elements toward their assembly positions, respectively; and

adjusting the positions of at least some of the magnet material elements generally circumferentially with respect to the circumferential surface of the at least one rotatable member and establishing thereby at least generally equal spacing between adjacent opposed ones of the opposite marginal edges of the magnet material elements so as to compensate for the difference in the arcuate lengths between the at least one magnet material element and the at least another magnet material element during the moving and locating step, respectively.

4,587,722

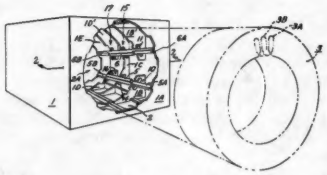
METHOD OF MAKING A DYNAMOELECTRIC MACHINE STATOR SUPPORTING STRUCTURE

William H. Miller, Albany, N.Y., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 487,964, Apr. 25, 1983, Pat. No. 4,536,671. This application Jun. 13, 1985, Ser. No. 744,355

Int. Cl.[4] H02K *15/00, 15/14*

U.S. Cl. 29—596 **5 Claims**



1. A method of making a stator and stator support structure assembly wherein an interference fit is provided between the stator and the stator support structure by thermally adjusting the diameters of the stator and the juxtaposed stator supporting surfaces of the support structure in relation to one another, comprising the steps of: providing a stator with a plurality of axially extending core support rods at arcuately spaced points on a circumference thereof, providing stator support structure having a plurality of preloaded resilient stress-relief elements each respectively mounted between one of the rods of a first selected group of core support rods on the stator circumference and an adjacent portion of the support structure having high radial rigidity, positioning the stator within the support structure in an interference fit with each rod of a second selected group of said rods disposed between the stator and adjacent portions of said support structure having low radial rigidity, and making each of said stress-relief elements effective to apply a compressive force on the respective rods in said first group that is substantially equal to the compressive force applied by the stator support structure to each of the rods in said second group responsive to said thermal adjustment whereby the stator is held in a preselected geometric configuration, within a preselected range of tolerances, by the compressive forces transmitted to it from the support structure through said first and second groups of axially extending rods.

4,587,723

METHOD FOR MAKING A HIGH CURRENT FIBER BRUSH COLLECTOR

Samuel J. Scuro, Verona, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 2, 1985, Ser. No. 729,761

Int. Cl.[4] H01R *43/12*

U.S. Cl. 29—597 **4 Claims**

1. A method of fabricating a high current fiber brush collector, comprising:

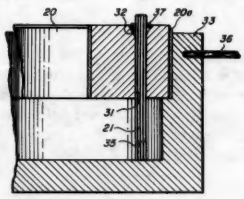
forming a collector ring having planar faces with at least one concentric row of equally spaced holes with beveled recesses in one of said faces;

inserting metal fiber brushes through respective ones of said

recesses and holes to extend a predetermined distance beyond the other of said faces;

placing coils of solder in each of said recesses around said brushes;

heating said ring uniformly throughout to a temperature below the melting point of said solder; and



sequentially applying additional heat to localized areas of the uniformly heated ring at each of said recesses to melt said solder; and

withdrawing the additional heat thereby causing the solder to solidify and form a joint between the ring and the brushes.

4,587,724

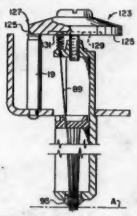
DOT MATRIX PRINT HEAD

James E. Blomquist, and Robert H. Wilczewski, both of 203 E. Main, Riverton, Wyo. 82501

Division of Ser. No. 499,208, May 31, 1983, abandoned, which is a division of Ser. No. 425,255, Sep. 28, 1982, Pat. No. 4,401,392, which is a continuation of Ser. No. 256,032, Apr. 21, 1981, abandoned, which is a division of Ser. No. 38,724, May 14, 1979, Pat. No. 4,279,518. This application Jun. 1, 1984, Ser. No. 616,792

Int. Cl.[4] H01F *7/06*

U.S. Cl. 29—602 R 5 Claims



1. A method of making a dot matrix print head including the steps of:

(a) mounting a plurality of print wires with impact ends and print ends about an axis in a wire guide assembly between at least front and rear guides,

(b) providing means for biasing each print wire in a first direction, each biasing means applying a force to each respective print wire,

(c) contacting all of said impact ends with a common planar surface,

(d) moving said planar surface toward said rear guide against the forces applied by said biasing means with said planar surface remaining perpendicular to said axis to advance said print ends of said print wires forwardly of said front guide, and

(e) grinding said print ends off until said print ends lie in a common plane perpendicular to said axis.

4,587,725

TERMINAL CRIMPING APPARATUS

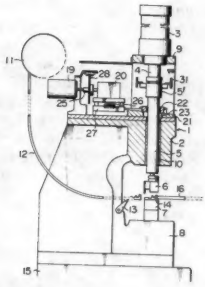
Yukihiko Ogawa; Saburo Kusumi, both of Komaki; Michio Fukuda; Toshifumi Okunishi, both of Osaka; Sinkichi Miwa, and Yosinobu Ohta, both of Yokkaichi, all of Japan, assignors to CKD Corporation; Sumitomo Electric Industries, Ltd. and Tokai Electric Wire Co., Ltd., all of, Japan

Filed Jul. 30, 1984, Ser. No. 635,435

Claims priority, application Japan, Aug. 9, 1983, 58-123500[U]

Int. Cl.[4] H01R *43/04*

U.S. Cl. 29—753 6 Claims



1. A crimping apparatus for crimping a terminal to the end of an electric wire comprising a reciprocating press ram provided at its lower end with a pressing die, an anvil disposed stationarily in opposition to said pressing die means for successively supplying terminals onto said anvil; means for feeding electric wires into the terminal on said anvil, means for actuating said press ram against said anvil thereby to crimp said terminal to the end of said electric wire, and crimp height adjusting means positioned to be engaged by said press ram during its stroke for limiting the stroke of said ram, and, hence, the crimp height, said crimp height adjusting means comprising a tapered spacer disposed perpendicularly to said press ram and provided with a tapered upper surface, a stopper member having a tapered lower surface and having an upper surface positioned to be contacted by said press ram, and a driving means for slidingly driving said tapered spacer in a direction perpendicular to said press ram to determine the crimping stroke of said ram.

4,587,726

METHOD AND APPARATUS FOR THE MANUFACTURE OF WELDING ELECTRODES

Werner A. Holmgren, Blodboksgatan 8, S 421 74 Västra Frölunda, Sweden

Filed Aug. 27, 1984, Ser. No. 644,774

Claims priority, application Sweden, Aug. 29, 1983, 8304658

Int. Cl.[4] H01R *43/00*

U.S. Cl. 29—825 18 Claims

1. A method for the continuous manufacture of powder-filled tubular electrodes including the steps of:

continuously feeding a metal strip at a predetermined speed;

forming said metal strip into an open channel with edges extending longitudinally of the channel;

forming a tube by abutting said edges;

discharging a welding powder into the tube from a filling station;

passing said tube through a welding station at which location the abutting edges are continuously welded to each other as the metal strip passes at said predetermined speed by heating said edges at a welding location;

inserting said welding powder into the tube at some distance from said welding location;

reducing the cross-sectional area of said welded and powder-filled tube to a desired dimension;

the improvement comprising:

feeding said metal strip downwards in the vicinity of said welding location at an angle to the horizontal plane which is greater than the limit sliding angle of said welding powder within said metal strip;

causing said powder to fall into said tube such that said speed of said powder when passing said welding location on said metal strip is greater than said predetermined speed of said metal strip at said welding location; and

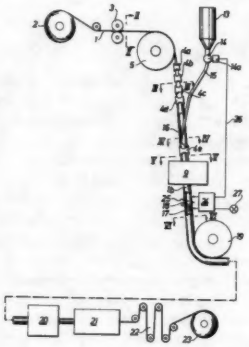
introducing a shielding gas into said welded tube in an amount so that interspaces between said powder particles are substantially filled with said shielding gas.

7. An apparatus for continuous manufacture of a powder-filled tubular electrode including:

first storing means for storing a metal strip;

means for feeding said metal strip at a pre-determined speed from said first storing means, said feeding means being operatively associated with said first storing means;

means for continuously forming said metal strip into an open channel with longitudinally extending edges and subsequently into a tube by abutting said longitudinal edges, said means for continuously forming said metal strip being operatively associated with said means for feeding said metal strip;



a welding station for continuously welding said abutting edges to each other by heating said edges to welding temperature at the welding location thereby producing a welded tube, said welding station being operatively associated with said means for continuously forming said metal strip;

second storing means for storing welding powder and being provided with a conduit for leading said welding powder to a nozzle means disposed for introduction of said welding powder, in operation, into said tube, said second storing means for storing said welding powder being operatively associated with said welding station;

means for proportioning a desired amount of said welding powder per time unit, said means for proportioning being operatively associated with said second storing means;

means for reducing the size of a cross-sectional area of said welded tube to a desired dimension, said means for reducing the size of said welded tube being operatively associated with said welding station;

the improvement comprising:

first guiding means being disposed to guide said metal strip in the vicinity of said welding station at an angle to the horizontal plane which is greater than the limit sliding angle of said welding powder, a falling path for said welding powder partly constituted by said metal strip formed into said open channel above said welding location on said metal strip substantially stationary with respect to said apparatus and said metal strip being formed into said welded tube below said welding location, said first guiding means being operatively associated with said welding station; and

said falling path, in operation, extending between an upper level above said nozzle means and a lower level below said welding location, the distance between said upper level and said welding location being so great that said falling welding powder is accelerated at said welding location to a falling speed which is greater than the speed of said metal strip; and

means for introducing a shielding gas into said welded tube, said means for introducing being operatively associated with said welding station, whereby interspaces between particles of said welding powder in said welded tube, during operation of said apparatus, are substantially filled with said shielding gas.

4,587,727

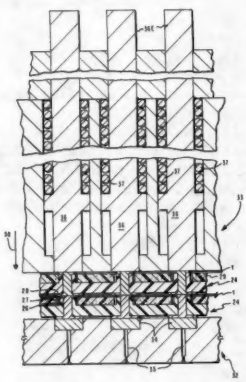
SYSTEM FOR GENERATING CIRCUIT BOARDS USING ELECTROERODED SHEET LAYERS

Willie Goff, Jr., Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 5, 1983, Ser. No. 510,540

Int. Cl.[4] H05K *3/36*

U.S. Cl. 29—830 **8 Claims**



1. A method of producing simulated printed circuit boards comprising:

electroeroding portions of metallic layers of a plurality of sheet-like, composite structures perforated in a uniform pattern so as to electrically isolate conductive paths between selected perforations; and

electrically connecting at least two composite structures by placing between them a generally planar member having electrical contacts arranged in an uniform pattern through a non-conductive substrate, said pattern corresponding to the pattern of perforations in the composite structures.

4,587,728

METHOD OF PRODUCING AN ELECTRICAL CONTACT MEMBER

Jean-Paul Favre-Tissot, Brignoud, France, assignor to Merlin Gerin, Grenoble, France

Filed Feb. 8, 1984, Ser. No. 578,083

Claims priority, application France, Feb. 21, 1983, 83 03051

Int. Cl.[4] H01R *43/02*

U.S. Cl. 29—879 **5 Claims**

1. A method for producing an electrical contact member having a contact finger made of a highly conductive material

and a contact having a contact base and a contact surface, said contact surface being made from a material comprising silver and covering the contact base, said method comprising the steps of:

cutting said contact finger made from a metal plate of highly conductive material and forming said contact finger with a protuberance on its edge for forming said contact base, the width of said metal plate being smaller than the width of said contact surface;

locating a resistance welding electrode at a spaced distance from said protuberance, said electrode having a die-shaped end surface, and rigidly clamping said contact

finger for forming with said electrode pair of welding electrodes;

placing a silver-based foil between said protuberance and said die-shaped end surface for forming said contact surface, the width of said foil being greater than that of said metal plate so that the foil extends laterally and symmetrically over the protuberance; and

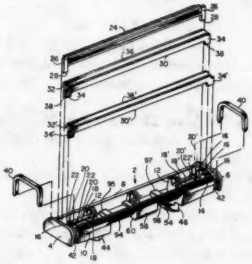
applying a compressive force to force said welding electrode onto said foil and protuberence, and simultaneously applying a resistance welding current so as to heat and laterally deform said protuberance into the width of said foil and shape of said die and thereby fix said foil onto the expanded protuberance.

4,587,729

SAFETY RAZOR

Chester F. Jacobson, Southboro, Mass., assignor to The Gillette Company, Boston, Mass.

Continuation-in-part of Ser. No. 419,186, Sep. 17, 1982, Pat. No. 4,488,357. This application Oct. 15, 1984, Ser. No. 661,086
The portion of the term of this patent subsequent to Dec. 18, 2001, has been disclaimed.
Int. Cl.[4] B26B *21/44*
U.S. Cl. 30—41 **3 Claims**



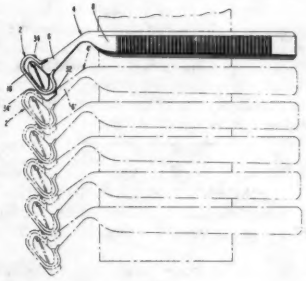
1. A safety razor including a blade assembly and a handle assembly, said blade assembly comprising a body portion of molded plastic, first and second blades mounted on said body portion between skin engaging elements adapted in operation to engage a surface being shaved ahead and behind, respectively, of said blades, said blades each being independently movable relative to said elements in response to forces encountered during a shaving operation, one of said skin-engaging elements comprising a guard portion independently movable during said shaving operation, one of said skin-engaging elements having thereon a shaving aid formed of a hydrophobic material and a water leachable hydrophilic polymeric material, spring finger biasing means integral with said body portion and exercising a bias against said guard portion and said first and second blades, said blade assembly having pivot mounting means thereon and an underside cam portion, said handle assembly comprising a grip portion, a head portion at one end of said grip portion, complemental pivot mounting means on said head portion comprising shell bearing means adapted to receive said blade assembly pivot mounting means, whereby said blade assembly, as a whole, is pivotally movable on said handle assembly in response to forces reciprocally movable in said head portion to engage said underside cam portion of said blade assembly to exercise a bias on said blade assembly and thereby urge said blade assembly to a given position on said shell bearing means.

4,587,730

SLEEVE FOR DISPOSABLE SAFETY RAZOR

Clemens A. Iten, Staunton, Va., assignor to American Safety Razor Company, Verona, Va.

Continuation of Ser. No. 307,326, Sep. 30, 1981, abandoned. This application Aug. 17, 1984, Ser. No. 641,429
Int. Cl.[4] B26B *21/00*
U.S. Cl. 30—90 **7 Claims**



1. A razor assembly comprising:

a handle;

a blade-carrying head attached to one end of said handle;

a body portion having a generally elliptical cross-section, formed by two inwardly-curved opposing sidewalls presenting two pairs of opposing edges, said sidewalls being joined along a first one of said two pairs of opposing edges by a top wall, said body portion being dimensioned to ensheath said blade-carrying head without touching said blade-carrying head;

a pair of recesses, disposed on said handle adjacent said blade-carrying head, for securing said body portion to said handle; and

a pair of flanges, extending respectively from each of a second one of said pairs of opposing edges of said sidewalls, for engaging said recesses and so for releasably securing said body portion on said handle and supporting said body portion everywhere spaced away from said blade-carrying head so that force applied to said body portion is transmitted exclusively to said handle and not to said blade-carrying head.

4,587,731

TOOL FOR CUTTING AND STRIPPING CABLE

Josef Krampe, An der Vogelrute 32, 4715 Ascheberg-Herbern, Fed. Rep. of Germany

Filed Jun. 8, 1983, Ser. No. 502,342
Claims priority, application Austria, Apr. 29, 1983, 7556/83
Int. Cl.[4] H02G *1/12*
U.S. Cl. 30—90.1 **22 Claims**

1. A cutting tool for stripping an insulation sheath from

single-wire or multi-wire cables, having an axis of symmetry and comprising two elongated and semi-cylindrical gripping cheeks connected to each other, each of said cheeks having an inner face and carrying at least one cutter element having a width substantially corresponding to a thickness of the sheath to be stripped from a cable, the respective cutter element being arranged on the inner face of the assigned gripping cheek and extended therefrom in the direction substantially perpendicular to the elongation of the respective cheek, said cheeks being pivotally mounted to each other to pivot about said axis of symmetry between an open position to receive a cable to be

processed and a closed position in which the inner faces of the gripping cheeks are located opposite to each other and said cutter elements are in the position to make a cut on said insulation sheath; and wire-stripping means including two blades each rigidly connected to the respective gripping cheek, said gripping cheeks each having an outer face opposite to the inner face carrying the cutter element, said blades being mounted to the outer faces of the respective cheeks, said blades having end portions which engage one over another in a scissor-like manner when said cheeks are in the closed position to strip the insulation sheath from a wire of the cable.

4,587,732

CABLE CUTTING AND CRIMPING

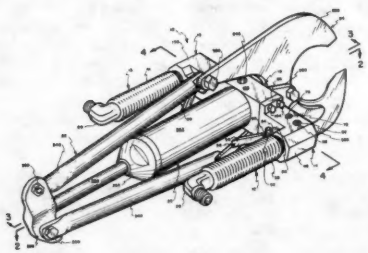
Michael A. Lind, Salt Lake City, and Michael R. Dunn, Sandy, both of Utah, assignors to New Draulics, Inc., Salt Lake City, Utah

Continuation of Ser. No. 426,014, Sep. 28, 1982, Pat. No. 4,521,963. This application Nov. 16, 1984, Ser. No. 671,400

The portion of the term of this patent subsequent to Jun. 11, 2002, has been disclaimed.

Int. Cl.[4] B23D *21/10*

U.S. Cl. 30—92 **7 Claims**



1. A hand held fluid driven mechanism for cutting, crimping, and the like comprising:

transversely opposed jaw-like closable front cutting blade means;

two way fluid cylinder assembly means comprising rearwardly directed piston rod means, the rearward extension and retraction of the piston rod means opening and closing the blade means;

bracket means pivotally connected to the piston rod means rearward of the cylinder assembly means and pivotally connected to the cutting blade means eccentric to but disposed axially within the length of the cylinder means;

means for controlling fluid flow to, from and within the cylinder assembly means, said controlling means comprising spaced manual actuator means and manual safety means, the controlling means further comprising means disabling the blade means when only one of the actuator means and the safety means is manually activated and means enabling the blade means when both the actuator means and the safety means are simultaneously manualy activated;

the actuator means and safety means being spaced one from the other such a distance as to require use of one hand of the operator to hold part of the weight of the mechanism and to activate the actuator means and the other hand to hold the remainder of the weight of the mechanism and to activate the safety means.

4,587,733

PERCUSSION DEVICE

Jackie Staempfli, Geneva, Switzerland, assignor to Tulcea, S.A., Vaduz, Liechtenstein

PCT No. PCT/CH84/00002, § 371 Date Sep. 11, 1984, § 102(e) Date Sep. 11, 1984, PCT Pub. No. WO84/02769, PCT Pub. Date Jul. 19, 1984

PCT Filed Jan. 9, 1984, Ser. No. 654,001

Claims priority, application France, Jan. 11, 1983, 83 00359

Int. Cl.[4] B26B *3/00*

U.S. Cl. 30—278 **5 Claims**

1. A percussion device for triggering the primer of an explosive charge in an actuator device, including a support arranged in order to be able to be attached to the said actuator device, a striker member which is equipped with a percussion tip and is mounted to be able to move with respect to the support so as to be able to trigger the primer under the effect of a force acting upon this striker member and a spiral spring for delivering the said force to the striker member, characterized in that the spiral spring (7) is a tension spring a first end of which is attached to the striker member (4), the percussion device including means (10) for holding back a second end of the spring so as to keep it in a stretched state corresponding with a cocked state of the percussion device, and for freeing this second end of the spring at the required moment.

4,587,734

GRATING TOOL

Jan Jonsson, Hantvernsvägen 8, 18400 Auersberga, and Ernst A. O. Strömberg, Wittstocusgatan 3b, 11524 Stockholm, both of Sweden

Filed Mar. 27, 1984, Ser. No. 593,856

Int. Cl.[4] B26B *3/00*

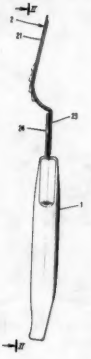
U.S. Cl. 30—279 R **3 Claims**

1. A tool for manual grating of a material such as cheese, comprising:

an elongated handle having a longitudinal axis; and

a blade connected to a forward end of said handle, said blade including a single-curved blade portion which is defined by a generatrix, said generatrix being at a substantially right angle with respect to said longitudinal axis, a connecting blade portion extending in the direction of said longitudinal axis from said forward end of said handle to said curved blade portion so as to space said curved blade portion from said forward end of said handle, said curved blade portion intersecting said connecting blade portion at an angle so that said curved blade portion arcs downwardly from said connecting blade portion, an upwardly inclined flat blade portion extending substantially continuously from said curved blade portion, and rows of apertures in adjoining regions of said curved blade portion and

of said flat blade portion, said rows extending parallel to said generatrix, each aperture being delimited by a scoop, each scoop projecting obliquely from a side of said blade defining a convex side of said curved blade portion, each scoop extending in a direction substantially at a right angle to said generatrix and generally toward said handle, each



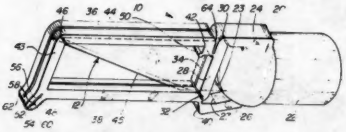
scoop having a projecting cutting edge, the apertures of the rows being arranged at regular intervals, the apertures of adjacent rows being displaced in the row direction, said flat blade portion including a forward lip region free of apertures so that said forward lip region is adapted to collect cheese gratings and to guide the blade.

4,587,735

KNIFE GUARD

Charles J. Walters, 14636 S. Keystone, Midlothian, Ill. 60445, and David Plahm, P.O. Box 283, Worth, Ill. 60482

Filed Jan. 18, 1985, Ser. No. 692,427
Int. Cl.[4] B26B *29/02*
U.S. Cl. 30—286 **19 Claims**



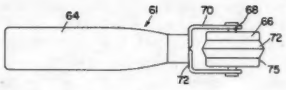
1. A knife guard for the cutting edge of a blade of a knife or the like, comprising an attaching means for attaching the kinfe guard to the kinfe, guard means for covering the cutting edge of the blade of the knife, said guard means being positionable into two positions, a first position with said guard means shielding the cutting edge and a second position with said guard means removed from the cutting edge to expose the same for use, hinge means between said attaching means and guard means for permitting movement of said guard means between its two positions by one of engaging said knife guard with an object and manually, spring means cooperating with said attaching means and guard means for holding said guard means in either of its two positions, said guard means comprising two elongated members and two cross members, at least one of said members being attached to said attaching means, and at least some of said members being used to shield the cutting edge when in said first position, said two cross and two elongated members being connected to each other by hinged joint to form a trapezoid.

4,587,736

CREASER TOOL

Stanley E. Staffeld, 1621 Woodsboro, Royal Oak, Mich. 48067

Continuation-in-part of Ser. No. 309,912, Oct. 8, 1981, Pat. No. 4,507,817. This application Mar. 29, 1985, Ser. No. 717,628
Int. Cl.[4] B26B *25/00*; B26D *3/08*
U.S. Cl. 30—292 **5 Claims**



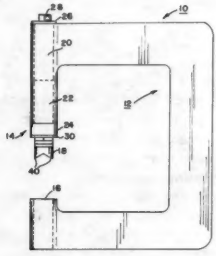
1. A creasing tool for relatively soft material such as corrugated board including a generally cylindrical roller having a central, shallow ridge projecting from the surface of the roller about substantially the entire circumference thereof, said roller defining cylindrical land surfaces on either side of said ridge, said ridge being defined by opposite ramp surfaces extending respectively upwardly from said land surfaces and meeting generally in a central plane generally perpendicular to the axis of rotation of the roller, said ramps surfaces forming an included angle of at least 90°, said ridge having a height in said plane substantially less than the width of said ridge and said ramp surfaces transitioning at said plane into one another to form a smooth circumferential apex, whereby as the roller traverses the surface of a sheet of corruagted board with moderate pressure applied by the operator, said ridge forms a weakened crease thereon and said land surfaces rollably engage the adjacent surfaces of corrugated board to Preclude penetration of the surface of the board by said ridge.

4,587,737

HAND PUNCH

James M. Wilson, P.O. Box 2984, Durango, Colo. 81301

Filed Aug. 2, 1984, Ser. No. 637,067
Int. Cl.[4] B26F *1/32*
U.S. Cl. 30—358 **5 Claims**



1. In a hand punch comprising a base member, a die member comprising part of said base member, a cutter head complementary with said die member adapted to be driven into said die member in order to punch material disposed on said die member,

the improvement which comprises:

a rotary head mounted in said base member coaxial with and spaced from said die member, said rotry head having a threaded axial bore and being mounted for in-place rotation relative to said base member;

a threaded member complementary with said threaded axial bore adapted to be threaded therein for axial movement when said rotary head is rotated relative thereto;

mounting means for mounting said cutter head on said threaded member in position such that axial movement of said threaded member causes said cutter head to move into and out of said die member;

cutting means on said cutter head for cutting into material to be punched, said mounting means and said cutting means cooperating to prevent rotation of said threaded member when said cutting means is engaged with the material to be punched,

whereby rotation of said rotary head causes said threaded member and the cutter head mounted thereon to move axially into said die and to effect punching of the material to be punched; in which said mounting means comprises a reversely threaded bore in said cutter head and a complementary reversely threaded portion at the bottom of said threaded member, whereby the tendency of said threaded member to rotate with said rotary head is counteracted as soon as said cutting means bites into the material to be punched; and in which a stop means is disposed between the threaded and reverse threaded portions of said threaded member, whereby when said cutter head is threaded onto the reverse threaded portion thereof, it jams against said stop means.

4,587,738

MEASURING RULE WITH NUMERICAL COUNTER

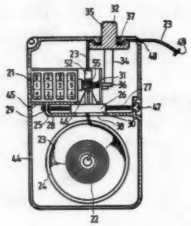
Young H. Kang, Kyungin Jutsek 1-Dong 101-Ho 508-2, Shinwal 2-Dong, Kangseo-Ku, Seoul, Rep. of Korea

Filed Oct. 25, 1984, Ser. No. 664,494

Claims priority, application Rep. of Korea, May 21, 1984, 84-4653[U]; Jun. 27, 1984, 84-6051[U]

Int. Cl.[4] G01B *3/12*

U.S. Cl. 33—139 **6 Claims**



1. A measuring rule comprising a housing, a numerical counter having a tapered knurled shaft mounted for rotation within the housing, a rotatable spool mounted in the housing, an elongated cord wound around the spool, spring bias means for rewinding the cord around the spool and stop means for automatically preventing rewinding of the cord about the spool until the stop means is disengaged by the user of the rule while permitting the cord to be freely pulled off the spool, said cord passing from the spool around the knurled shaft to turn it and the counter as the cord is pulled off the spool, through the stop means and out of the housing, whereby the length of cord pulled out of the rule and passing around the knurled shaft is indicated by the numerical counter, and error correcting means for adjusting the location of the cord where it passes around the tapered shaft along its length.

4,587,739

GAGE FOR MEASURING DISPLACEMENTS IN ROCK SAMPLES

David J. Holcomb, and Michael J. McNamee, both of Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 18, 1985, Ser. No. 756,127

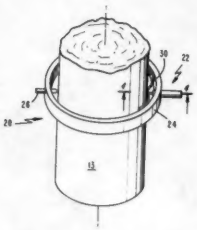
Int. Cl.[4] G01B *7/16*

U.S. Cl. 33—143 L **11 Claims**

1. A gage for measuring strain in a rock sample, comprising:

(a) a mounting ring having an inner diameter slightly greater than the diameter of said sample;

(b) means for mounting said ring on said sample, said mounting means including an adjustment means providing a first point of contact between the ring and sample, and attachment means connected to the ring for providing a second point of contact between the ring and sample, said attachment means being generally immovable in a direction perpendicular to the plane of said ring to support the weight of the ring on the sample, said attachment means being yieldable diametrically



by a distance equal to a change in the diameter of the sample in response to diametric strain in the rock sample; and

(c) sensor means including strain transmitting means in contact with said attachment means for accurately transmitting movement of said attachment means caused by strain in the rock sample to said sensor means producing a variable output in proportion to strain, said strain transmitting means being independent of forces acting upon said attachment means and thereby being isolated from said forces by said attachment means.

4,587,740

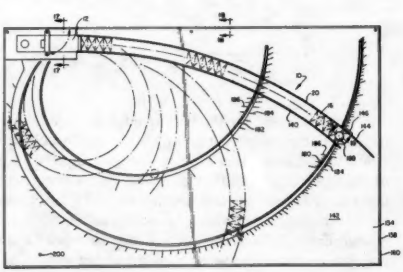
ADJUSTABLE RADIAL CURVE RADIUS SETTING SCALE

Richard R. Spinning, 2280 Clifton St., Sebring, Fla. 33870

Continuation-in-part of Ser. No. 525,207, Aug. 23, 1983, Pat. No. 4,532,714, which is a continuation-in-part of Ser. No. 454,527, Dec. 30, 1982, abandoned. This application May 22, 1985, Ser. No. 736,727

Int. Cl.[4] B43L *13/20*

U.S. Cl. 33—177 **12 Claims**



1. An adjustable radial curve radius setting scale comprising:

a supporting bar;

a plurality of radial arms;

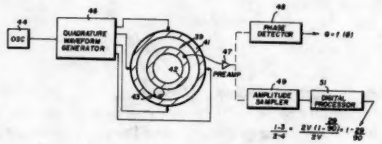
a plurality of long chords attached at one end to the supporting bar and at the other end to the radial arms;

a plurality of first diagonal braces attached at one end to the supporting bar and at the other end to the radial arms;

a plurality of second diagonal braces attached at one end to the supporting bar and at the other ends to the radial arms;

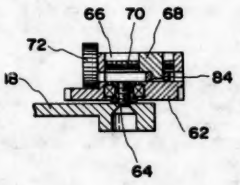
a plurality of brace chords overlapping each other and attached to the second diagonal braces;
a ruling edge attached to the radial arms and the first and second diagonal braces;
a bar scale attached at one end to the supporting bar and at the other end to one of the diagonal braces and one of the radial arms; and
a support base for the adjustable radial curve radial setting scale having means for securing the supporing bar thereto.

4,587,741
BALL INCLINOMETER
Louis H. Rorden, Los Altos, and Edward C. Fraser, Cupertino, both of Calif., assignors to Develco, Inc., Sunnyvale, Calif.
Filed Sep. 27, 1983, Ser. No. 536,556
Int. Cl.[4] G01C *9/06*
U.S. Cl. 33—366 **26 Claims**



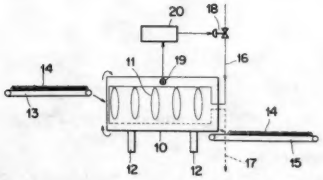
1. An inclinometer comprising means defining a continuous, closed toroidal race, a spherical ball disposed in said race for free movement therein under the influence of gravity, said toroidal race and said ball configured for single point contact therebetween, means for establishing an electromagnetic field along said race with said ball causing a unique perturbation in said electromagnetic field indicative of the position of said ball, and means for sensing said perturbation and hence said ball position to sense the direction of a gravity vector, and wherein said means for establishing an electromagnetic field comprises a source electrode adjacent one side of said toroidal race, means coupling a signal to said source electrode for establishing an electric field, a collector electrode adjacent an opposite side of said toroidal race, with said ball functioning to capacitively couple signals on said source electrode to said collector electrode, and including means for detecting a signal on said collector electrode whereby the signals coupled to said collector electrode are indicative of the position of said ball in said race, which is in turn indicative of the direction of the gravity vector.

4,587,742
SCALE BALANCING DEVICE IN UNIVERSAL PARALLEL RULER DEVICE
Yasutomo Yoshida, Tokyo, Japan, assignor to Mutoh Industry Ltd., Tokyo, Japan
Filed Jan. 9, 1985, Ser. No. 689,897
Int. Cl.[4] B43L *13/02*
U.S. Cl. 33—438 **5 Claims**



1. A scale balancing device for balancing the weight of the scales of a universal parallel ruler, said device comprising a head structure having the scales rotatably mounted thereon, a rotating member rotatably mounted on said head structure separate from said scales, means rotatably interlocking said rotating member and said rotatable scales, and a spring means having one end rotatably connected to a point on said rotating member eccentric to the axis of rotation thereof and the other end rotatably connected to a non-rotatable part of said head structure, said spring means, when said scales are rotated to a position in which the weight thereof is vertically in line with the axis of rotation thereof, having substantially no tension therein and when the scales are rotated ninety degrees from said position, having tension for exerting a maximum force on said eccentric connection point on said rotating member and sufficient in magnitude and having a direction which substantially cancels out the torque on said rotating member from the weight of the scales.

4,587,743
METHOD OF CONTROLLING TEMPERATURE OF DRYING MACHINE
Yutaka Nambu; Hitosi Sugawara, and Yasuo Saitoh, all of Hiratsuka, Japan, assignors to The Japan Tobacco & Salt Public Corporation, Japan
Filed Oct. 18, 1984, Ser. No. 662,079
Claims priority, application Japan, Oct. 20, 1983, 58-195335
Int. Cl.[4] F26B *21/10*
U.S. Cl. 34—31 **1 Claim**



1. A method of controlling by presetting the initial ambient temperature within a drying machine by controlling a supply of heat thereto from a heat source in response to a temperature signal representative of the ambient temperature generated by a temperature detector for detecting the ambient temperature within the drying machine, comprising the steps of:
(a) supplying heat from the heat source to the drying machine for a period of time determined in accordance with an error signal between a reference signal corresponding to a preset target temperature range and said temperature signal when said detected temperature is outside said preset target temperature range and a change in temperature per unit time obtained from said temperature signal is about equal to or lower than a predetermined value and stopping the heat source supply for a predetermined period of time following termination of the heat source supplying period of time;
(b) stopping the heat source supply if the detected signal is outside said preset target temperature range and said change in temperature per unit time is higher than said predetermined value;
(c) supplying heat from the heat source to the drying machine for the period of time determined in accordance with the error signal if the detected temperature falls within said target temperature range and the change in temperature per unit time is equal to or lower than a predetermined minus value and stopping the heat source supply for the predetermined period of time following termination of the heat source supply period;
(d) stopping the heat source supply if the detected temperature falls within said target temperature range and the change in temperature per unit time is higher than said predetermined minus value; and

(e) stopping the heat source supply if the detected temperature surpasses said target temperature range.

4,587,744

FLUIDIZED BED APPARATUS

Herbert Hüttlin, Lörracher Strasse 14, 7853 Steinen, Fed. Rep. of Germany

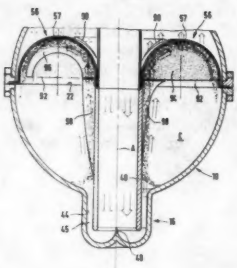
PCT No. PCT/EP83/00247, § 371 Date May 18, 1984, § 102(e) Date May 18, 1984, PCT Pub. No. WO84/01113, PCT Pub. Date Mar. 29, 1984

PCT Filed Sep. 21, 1983, Ser. No. 617,089

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1982, 3234911

Int. Cl.⁴ F26B *17/00*

U.S. Cl. 34—57 R **8 Claims**



1. A fluidized bed apparatus for mixing, drying, granulating, pelleting, polishing and/or coating pulverous or granular material, comprising:

a container, which is at least approximately rotationally symmetrical with respect to an at least approximately vertical container axis, and which has an upper edge;

a plunger pipe projecting axially from above into the container and connectable to a gas source;

dish means disposed below the plunger pipe for deflecting gas entering through the plunger pipe in an upward direction so as to fluidize material disposed within the container;

a deflector shield which is at least approximately rotationally symmetrical all around the plunger pipe and which is disposed in an upper area of the container, for deflecting material, entrained upwardly by gas, in an outward direction, wherein said deflector shield has elongated recesses, each having an at least approximately radial longitudinal axis, said recesses each containing a screen insert to be permeable to gas at least in individual areas, and wherein said deflector shield forms and arc shaped vault which extends from said plunger pipe radially outwardly to the upper edge of said container, said vault having a circular apex, the apex diameter of which corresponds at least approximately to the mean value of the diameters of the plunger pipe and the upper container edge; and

a gas outlet opening disposed above the deflector shield.

4,587,745

BERRY DRYING APPARATUS

Lincoln L. Tanner, Box 177, Brunswick, Ga. 31520

Filed Apr. 1, 1985, Ser. No. 718,440

Int. Cl.⁴ F26B *17/18*

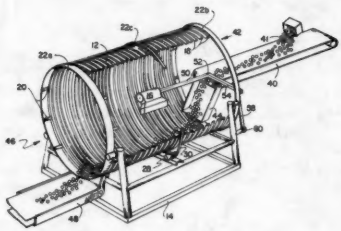
U.S. Cl. 34—95 **8 Claims**

1. An apparatus for drying berries and the like, comprising:

a helical drum having an interior for supporting the berries, the drum comprising a continuous helix each turn of which is in parallel spaced apart relation to the adjacent turns, the spacing between adjacent turns of the helix being substantially constant and being smaller than the diameter of the berries;

means for supporting said helical drum for rotation about the longitudinal axis of said helical drum; and

means disposed inside said helical drum for generating a flow of air outwardly through the spaces between the turns of said helical drum;



whereby berries which are placed inside said drum are supported on and between the turns of said helical drum and are carried along the length of said drum by the rotation of said helical drum while being subjected to a drying current of air, so that moisture and debris from the berries passes through the open spaces between adjacent turns of the helix supporting the berries.

4,587,746

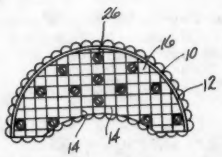
SOLE AND HEEL SHOE TAP

Alvin Williams, Apt. 4B, 720 Lenox Avenue, New York, N.Y. 10039

Continuation of Ser. No. 454,662, Dec. 30, 1982, abandoned. This application Mar. 14, 1985, Ser. No. 712,333

Int. Cl.⁴ A43B *13/22*

U.S. Cl. 36—73 **2 Claims**



1. A sheet metal shoe tap adapted to be secured to the bottom surface of the sole and/or heel of a shoe to minimize wear thereof when the shoe is in use, said tap comprising:

a thin flat horizontal member having an upper surface adapted to bear against the bottom surface of the shoe and a lower surface;

a metal lip formed integral with the lower surface of said member along the periphery thereof and extending vertically downward, said lip terminating in an essentially horizontal bottom edge;

a plurality of thin straight horizontally elongated metal plates, some plates being parallel to each other, other plates being perpendicular to each other, said plates being integrally joined with each other and to said lip and to the lower surface of said member, the lower edges of said plates and the bottom edge of said lip lying in a common plane, said plates cooperating with said lip and the lower surface of said member to define a plurality of generally rectangular cells open at bottom ends coincident with said plane and closed at the top end by said member, selected ones of said cells each having one vertical opening extending entirely through said member, the remaining cells

lacking said opening, wherein said common plane is inclined at about a five degree angle relative to the horizontal in the direction of the heel portion of said shoe;

a plurality of sheet metal screws equal in member to the number of openings, each screw having an enlarged head larger in area to the cross sectional area of an opening, each screw extending upwardly through a corresponding opening into the shoe with the head disposed within the corresponding cell to secure the member to a position above the common plane; and

sound deadening and cushioning material filling each of said remaining cells.

4,587,747

SKI BOOT INTO WHICH THE FOOT IS INTRODUCED FROM THE REAR

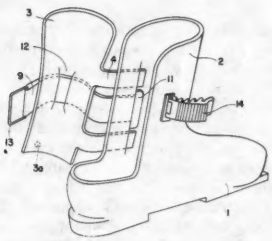
Guy Courvoisier, and Simon Arieh, both of Geneva, Switzerland, assignors to Lange International S.A., Fribourg, Switzerland

Filed Nov. 5, 1984, Ser. No. 668,267

Claims priority, application Switzerland, Nov. 11, 1983, 6092/83

Int. Cl.[4] A43B *5/04*

U.S. Cl. 36—117 **11 Claims**



1. A ski boot into which the foot is introduced from the rear, comprising a rigid shell designed to fit around the foot, the heel and the lower fore-part of the ankle, and an upper or leg consisting of a front part in the form of a gutter-section, opened towards the rear and integral with the said shell, and of a rear part in the form of a gutter-section, articulated upon the boot and arranged so as to be housed within said front part, thus forming an oversleeve designed to encompass the ankle, means for fastening said oversleeve in a closed position, and connection means articulating said rear part of the upper on the boot for allowing at least two degrees of freedom for this rear part, and thus permitting every movement, albeit limited, in rotation or in translation, in a substantially vertical plane parallel to the direction of the foot with the fastening means closed.

4,587,748

STUDDED FOOTWEAR

Roy S. Collins, West Midlands, England, assignor to Triman Limited, Tamworth, England

Continuation of Ser. No. 466,962, Feb. 16, 1983, abandoned. This application Apr. 12, 1985, Ser. No. 722,424

Claims priority, application United Kingdom, Feb. 17, 1982, 8204673

Int. Cl.[4] A43B *5/00, 15/00*

U.S. Cl. 36—127 **11 Claims**

1. For use with an article of footwear having a groung-engaging lower surface, the combination of an insert and plurality of studs for engagement with said insert,

a. said insert comprising:

1. a plurality of downwardly opening cylindrical sockets internally screw threaded for receiving externally screw threaded spigots on said studs;

2. and a support interconnecting said sockets;

3. said insert being made as a unitary moulding of a flexible plastics material;

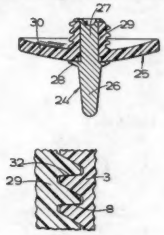
4. the screw threads in each socket being shaped to afford a helical bearing surface facing the upper end of the socket, said bearing surface being defined by a generatrix extending radially from the axis of the screw thread and at least substantially normal to said axis, whereby said bearing surface is substantially flat;

b. each of said studs comprising:

1. an upwardly facing annular face; and

2. a ground-engaging portion projecting downwards from said face;

3. said externally screw-threaded spigot projecting upwards from said face, the screw-thread on the spigot being formed of a plastic moulding defining at least a part of said spigot and being complementary to that of each socket, said thread being shaped to afford a helical bearing surface facing downwards, towards said face,



said bearing surface being defined by a generatrix extending radially from the axis of the screw-thread and at least substantially normal to said axis, whereby said bearing surface is substantially flat; the arrangement being such that in use, when said insert is incorporated in an article of footwear, the spigot of a stud is screwed into a socket in the insert and said face engages the lower surface of the article of footwear, any lateral force applied to the ground-engaging portion of the stud tends to tilt the stud about an area of contact between the outer edge of said face and said lower surface whereby the spigot is biased downwards, in a direction out of said socket, that bias being resisted by the mutual engagement of said substantially flat bearing surfaces in the socket and on the spigot, and there is substantially no component of force directed radially outwards such as would be the case if the bearing surfaces were inclined, as in conventional threads, and not substantially flat.

4,587,749

VENTED MOTORCYCLE BOOT

Remo Berlese, 31036 Sala D'Istrana, Treviso, Italy

Filed Nov. 28, 1984, Ser. No. 675,813

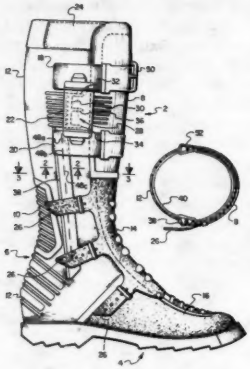
Int. Cl.[4] A43B *5/14, 7/06*

U.S. Cl. 36—131 **11 Claims**

1. In a motorcycle boot having an outer wall, a lower foot portion, an upper leg portion and an intermediate ankle portion, the improvement comprising:

a generally forward facing air scoop extending outwardly from the outer boot wall and adapted to collect air when the wearer is riding forward on a motorcycle, the scoop cooperating with the exterior of the outer boot wall to form a generally rearward directed air channel for incoming air, and

an air duct connecting the rearward portion of the air scoop channel to the interior of the boot for transmitting air



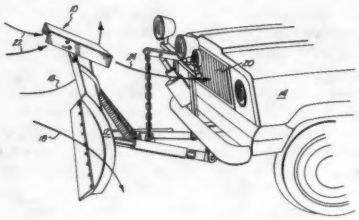
collected by the scoop to the boot interior, and thereby cooling the wearer's foot.

4,587,750

AIR SCOOP MOUNTED ON SNOW PLOW

Duane Larson, P.O. Box 3265, Mankato, Minn. 56001

Filed Jan. 10, 1985, Ser. No. 690,307
Int. Cl.[4] E01H *5/00*; B60K *11/00*
U.S. Cl. 37—241 **4 Claims**



1. An air scoop arrangement for use with a snow plow blade arranged to be front mounted on a motor vehicle, comprising:

air channeling means including an air engaging wall and a pair of side walls extending from opposite edges of the engaging wall, mountable on the snow plow blade with the air engaging wall substantially disposed above a topmost edge of the snow plow blade to engage and direct air towards a radiator carried by the vehicle;

bracket means for mounting the air channeling means in adjustable angular relation on the snow plow blade, the bracket means includes a pair of support arms, each having a first end secured to the snow plow blade and a second end rotatably mounted about an axis to the side walls of the air channeling means; and

means for releasably fixing the orientation of the air channeling means with respect to the bracket means including:

a first aperture located within the support arm at a predetermined distance from the pivot axis;

an array of second apertures located within each side wall of the air channeling means, each second aperture in each array being spaced at the same distance from the support arm pivot axis as the support arm aperture, such that each first aperture can be axially aligned with any one of the second apertures in the array defined by the side wall to which the support arm is pivotally attached; and

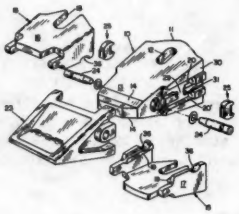
bolt means extending through the first aperture and one of the second apertures with which it is axially aligned, for releasably fixing the air channeling means in a selected orientation with respect to the snow plow blade.

4,587,751

WEAR CAP STYLE EXCAVATING TOOTH

Kaj Sjogren, Aloha, and James Brosh, Beaverton, both of Oreg., assignors to ESCO Corporation, Portland, Oreg.

Filed Mar. 6, 1985, Ser. No. 708,648
Int. Cl.[4] E02F *9/28*
U.S. Cl. 37—142 R **2 Claims**



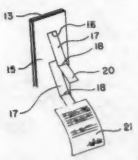
1. A tooth assembly comprising a relatively elongated adapter having a mounting end and a point receiving end, top and bottom longitudinally extending wear surfaces flanked by side surfaces, a wear cap removably covering one of said wear surfaces, a point on said adapter normally retaining said wear cap in place on said adapter, a cavity in one of said side surfaces and lock means resiliently, removably mounted in said cavity, said wear cap having notch means alignable with said cavity and shaped to cause said wear cap to bear against said lock means upon a dislodging force being applied to said wear cap, said cavity being defined by outer shoulder-providing walls, said lock means including a body and insert means, each of said body and insert means having oppositely directed nose means, said insert means including resilient means operative to enable said nose means to snap into place behind said shoulder providing walls.

4,587,752

EXHIBITOR MEANS

Avvari R. Swamy, Littleton, N.C. 27850

Filed Mar. 18, 1985, Ser. No. 712,673
Int. Cl.[4] G09F *1/10*
U.S. Cl. 40—124 **3 Claims**



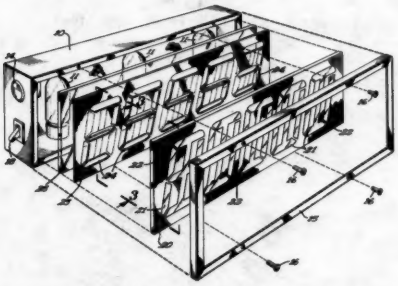
1. An exhibitor means comprising: a generally vertical support member; a backing secured to said support member and having a plurality of horizontal slots vertically spaced thereon; a plurality of flat, finger-like exhibitor arms extending substantially downwardly, in an overlapping fashion, from respective horizontal slots on said backing, said exhibitor arms having a bent configuration so that the free end thereof extends substantially outwardly from said support member; stiffener means on said exhibitor arm for maintaining the outwardly bent configuration of the same; and adhesive means for securing memoranda and the like to said free end of said exhibitor arms.

4,587,753

HOUSE SIGNALING DEVICE

Douglas M. Harper, 3746 Conroy Trail, Inver Grove Heights, Minn. 55075

Filed Mar. 16, 1984, Ser. No. 590,508
Int. Cl.[4] G09F *3/04*
U.S. Cl. 40—451 **4 Claims**



1. An observable multiple character incidia forming assembly, the improvement comprising:

(a) a first sheet of light transmitting material having a plurality of indicia forming characters of a number "8" including a centrally located "1" arranged therein, said indicia formed in a side-by-side arrangement;

(b) a second sheet of light blocking material having opaque qualities with the same indicia forming characters as found in said first sheet, but disposed so that they may be superimposed one on the other, said characters having been die cut along the contours of each segment forming said indicia to facilitate removal of said light blocking material from said second sheet at predetermined locations;

(c) a frame member engaging each of said first and second sheets of material along their edges and holding all of said sheets to display the indicia formed by said sheets;

(d) a light containing housing secured to said frame and extending rearwardly from said frame;

(e) a light source causing light to be projected forwardly through said first and second sheets where there is an absence of opaque material; and

(f) a photoelectric cell connected in said light source interrupting said light projected when sunlight is equivalent to a predetermined value set in said photoelectric cell;

(g) a flasher secured in series with said photoelectric cell; and

(h) a switch connected in parallel with said flasher to electrically insert said flasher in the circuit when desired.

4,587,754

ILLUMINATED DISPLAY DEVICES

Martin W. G. Ossner, No. 8 Dolphin St., Randwick, New South Wales, 2031, Australia

Filed Mar. 21, 1984, Ser. No. 592,421
Claims priority, application Australia, Mar. 29, 1983, PF8671
Int. Cl.[4] G09F *13/04*
U.S. Cl. 40—564 **8 Claims**

1. An illuminated display comprising a skeletal support frame an a plurality of light box modules,

the skeletal support frame forming a plurality of contiguous, rectangular openings, each opening being of a predetermined size to receive one light box module, the front of the support frame defining an outside vertical surface,

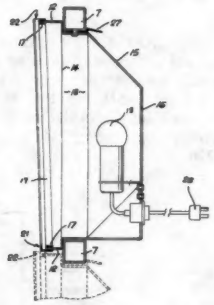
each module including a casing, a light source within the casing and means for mounting a transparency in front of the light source,

each casing have a first rectangular portion of a larger size than the rectangular opening in the skeletal frame which receives the casing, and a second rectangular portion of smaller size than the opening, the first and second rectangular portions of the casing being contiguous and having a vertical step between them,

each casing being removably inserted in an opening in the frame with the step abutting the outside vertical surface of the frame, the first rectangular portion projecting outwardly beyond the vertical surface of the frame and the second portion of the casing fitting within the rectangular opening,

releasable means for retaining the module within the frame,

the means for mounting the transparency in the module



being a keeper flange supported by the projecting first rectangular portion of the casing, the top portion of the keeper flange being open to receive the transparency,

the top of the said first rectangular portion of the casing extending outwardly from the step a greater distance that the bottom portion thereby to form an angle between the keeper flange and the step,

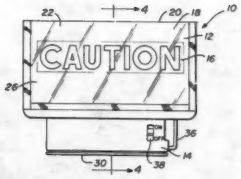
whereby the top opening of the keeper flange of a first lower module is forward of the bottom edge of the keeper flange of a second upper module which is located contiguous with the top edge of the first module so that a transparency may be inserted and removed from the first module without removing either module from the frame.

4,587,755

PORTABLE CHANGEABLE LIGHTED SIGN

Richard B. Sunshine, 6835 Quarterway, Dallas, Tex. 75248

Filed Jan. 9, 1984, Ser. No. 569,314
Int. Cl.[4] G09F *13/04*
U.S. Cl. 40—571 **1 Claim**



1. A portable changeable sign comprising:

an elongate rectangular base adapted to be vertically self-supporting along one side thereof;

a direct current power supply disposed within the base;

a fluorescent light tube disposed within the base;

the base further including a transparent lens adjacent the light tube;

a switch for selectively connecting the power supply to the light tube;

a screen element constructed of a single piece of semi-rigid

translucent plastic material permanently creased along a medial edge thereof to form first and second display panels adapted for receiving light from the light tube and diffusing the light to a removable plastic message element disposed on an outer surface of at least one display panel, the display panels forming an acute angle at the medial edge when deployed with the lower edges of said panels spread for removable attachment to the elongate base, said panels being movable to a flat storage position when removed from the elongate base; and

disengageable fastening material disposed upon opposite upper side portions of the elongate base and opposite lower inner portions of the first and second display panels.

4,587,756

MAGAZINE FOR A SMALL ARM

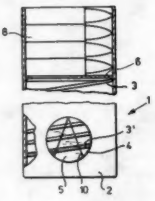
Horst Jakubaschk, Oberndorf-Bochingen, and Erich Weisser, Tennenbronn, both of Fed. Rep. of Germany, assignors to Heckler & Koch GmbH, Fed. Rep. of Germany

Filed Jul. 12, 1984, Ser. No. 629,990

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1983, 3325216

Int. Cl.[4] F41C *25/02, 27/14*

U.S. Cl. 42—50 **11 Claims**



1. A magazine for a small arm comprising a follower spring and a follower, means for indicating the loading condition of the magazine, and indicator means responding to the position of a section of the follower spring located at a distance from the follower and provided at a point of the magazine which is visible when the small arm is adapted to be fired, said indicator means comprising a recess in a side wall of the magazine, one winding of the follower spring which is located in the viewing area of the recess, at least in certain selected loading conditions of the magazine, being provided with a visual mark, said recess being sealed off by a transparent humidity-type cover.

4,587,757

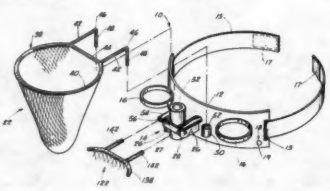
FISHING DEVICE

Hewitt P. Lirette, Rte. 2, Box 678, Chauvin, La. 70344

Filed Oct. 25, 1984, Ser. No. 664,531

Int. Cl.[4] A01K *97/00*

U.S. Cl. 43—21.2 **17 Claims**



1. A fishing apparatus, comprising:

a. an elongated base plate;

b. means on said base plate for securing same at the waist of the wearer;

c. means secured to said base plate for receiving and supporting a fishing rod;

d. a dip net adapted to be secured to said base plate; and

e. means attached to said base plate for receiving and supporting said dip net in a substantially horizontal position extending outwardly from the waist of the wearer, allowing hands free use of said dip net for netting a fish by the wearer bending at the waist to deflect said dip net toward the water.

4,587,758

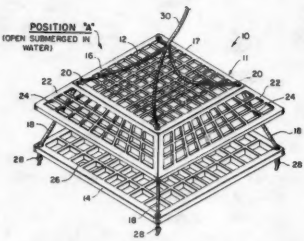
CRAB TRAP

Charles Ponzo, 37 Abby La., Shirley, N.Y. 11967

Filed Jul. 16, 1984, Ser. No. 631,332

Int. Cl.[4] A01K *71/00*

U.S. Cl. 43—102 **6 Claims**



1. A crab trap comprising in combination:

(a) a lower perforated surface having corners with apertures and being heavier than water;

(b) a one piece perforated buoyant enclosure having corners with apertures and being positioned above said lower surface; and

(c) a plurality of hoist lines having lower extremities with integral top and bottom stop members, said plurality of hoist lines being first bundled together and then diverging through said apertures in said corners of said one piece perforated buoyant enclosure and thereafter passing through said corresponding apertures in said corners of said lower perforated surface, said plurality of hoist lines being secured by said bottom stop members disposed at said lower extremities of each of said plurality of hoist lines and being below said lower perforated surface and said top stop members disposed on said plurality of hoist lines above said one piece perforated buoyant enclosure, said top stop members limiting travel of said one piece perforated buoyant enclosure and both of said top and bottom stop members allowing said lower perforated surface and said one piece perforated buoyant enclosure to be easily raised and lowered, so that when the crab trap is lowered into water the weight of said lower perforated surface pulls said plurality of hoist lines through said apertures in said corners of said one piece perforated buoyant enclosure which floats while said lower perforated surface sinks and recovery of the crab trap along with captured crabs is achieved by pulling on said bundled hoist lines and raising said lower perforated surface until it meets said one piece perforated buoyant enclosure and prevents the escape of captured crabs.

4,587,759

LOCKING WINDOW ASSEMBLY

Ronald A. Gray, 2600 Camp Creek Pkwy., Apt. 31-D, Atlanta, Ga. 30337

Filed May 30, 1984, Ser. No. 615,252

Int. Cl.[4] E06B *3/00*

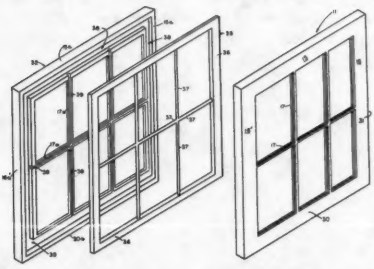
U.S. Cl. 49—50 **6 Claims**

1. An improved locking window assembly comprising in combination:

a pair of rectangular peripheral rail and stile assemblies, each having a receiving trough therein;

a plurality of rectilinear muntins, each having a receiving channel therein, disposed within each of said pair of rectangular peripheral rail assemblies;

a rigid metallic reinforcing assembly including a rectangular reinforcing bar structure sized to fit within said receiving



trough and a plurality of rectilinear muntin reinforcing rods connected to said reinforcing bar structure to fit within said receiving channels; and

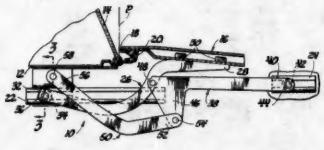
means for securing said pair of rectangular peripheral rail and stile assemblies and said plurality of rectilinear muntins together, with said rigid metallic reinforcing assembly secured thereinbetween.

4,587,760

CLOSURE PANEL HINGE ASSEMBLY

Lawrence P. Brissette, Utica, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 12, 1985, Ser. No. 754,155
Int. Cl.[4] E05D *15/30*
U.S. Cl. 49—252 **3 Claims**



1. In an automotive vehicle or the like having body structure and a closure panel movable from a generally horizontal closed position to an open position, said closure panel having an edge, an improved hinge assembly for mounting said closure panel to said body structure so as to shift said closure panel edge away from a generally vertical plane associated with said body structure as said closure panel is raised from said closed position toward said open position, comprising,

first and second generally horizontally extending guide means on said body structure,

a hinge strap having one end secured to said closure panel and its other end pivotally and slidably connected to said first guide means to provide a first sliding pivot,

a follower link having one end thereof pivotally secured relative to said closure panel to provide a first movable pivot and its other end pivotally and slidably connected to said second guide means to provide a second sliding pivot,

and a control link having one end pivotally secured to said follower link one end so as to provide a second movable pivot, the other end of said control link being pivotally secured to said body structure so as to provide a fixed pivot at a point such that said control link one end moves upwardly and away relative to said plane when said control link is swung about said fixed pivot,

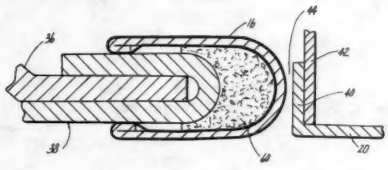
whereby, the initial raising of said closure panel from said closed position swings said control link about said fixed pivot to initially move said control link one end, and thereby move said follower link one end and first and second movable pivots, upwardly and away relative to said plane as said follower link rotates relative to said closure panel about said first movable pivot and said control link rotates relative to said follower link about said second movable pivot, thereby shifting said closure panel edge initially away from said plane, said shifting being accommodated by said first and second sliding pivots, which simultaneously slide horizontally along said respective first and second guide means, continued raising of said closure panel causing said closure panel to tilt upwardly relative to said plane to said open position as said follower link continues to rotate relative to said closure panel about said first movable pivot and said first and second sliding pivots continue to slide horizontally along said respective first and second guide means, thereby precluding the invasion of said plane by said closure panel edge.

4,587,761

DOOR EDGE GUARD AND METHOD FOR DE-EMPHASIZING THE GAP BETWEEN A DOOR EDGE AND ADJACENT STRUCTURE

Robert Adell, Sunnyvale, Tex., assignor to U.S. Product Development Company, Sunnyvale, Tex.

Filed Apr. 26, 1984, Ser. No. 604,186
Int. Cl.[4] B60J *5/00*
U.S. Cl. 49—462 **15 Claims**



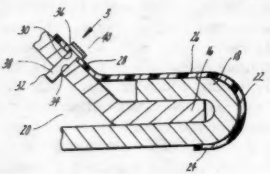
1. In combination with a vehicle having a swinging closure having a trailing edge which opens and closes against adjacent body structure of the vehicle such that in the closed position there exists a gap between said trailing edge and said adjacent body structure of the vehicle, an edge guard fitting onto said trailing edge and having a base and inner and outer legs extending from said base and disposed against opposite sides of said trailing edge, said edge guard having its legs of such lengths when viewed in cross section that the edge guard may be more fully or less fully positioned onto the edge over a range of adjustment positions corresponding to a range of thicknesses of said gap, said edge guard and said edge thereby cooperatively defining a variable volume space bounded by said edge, by said base, and by those portions of said legs immediately contiguous said base, and a filler material disposed in said space between said edge and the edge guard which allows the installation adjustment of the edge guard so that the edge guard can be positioned to substantially fill the gap when viewed from the exterior of the vehicle and which subsequently hardens to permanently define the final installed edge guard position wherein said base is spaced from the edge by the hardened filler occupying said space.

4,587,762

EDGE GUARD WITH INTEGRAL ATTACHING FLANGE

Robert Adell, Sunnyvale, Tex., assignor to U.S. Product Development Company, Sunnyvale, Tex.

Filed Aug. 31, 1984, Ser. No. 646,598
Int. Cl.[4] B60J 5/00
U.S. Cl. 49—462 16 Claims



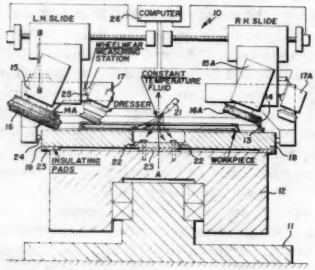
1. In combination with a swinging closure having a trailing edge cooperatively defined by an outer panel and an inner panel having respective margins secured together and wherein the two panels bound an interior space adjacent the trailing edge, an edge guard for at least a portion of the trailing edge comprising in transverse cross section a generally U-shaped portion fitting onto the trailing edge and a flange portion projecting from said U-shaped portion and against said inner panel to overlie said interior space, and fastening means for fastening the edge guard to the swinging closure comprising means coacting between said flange portion and said inner panel where said flange portion overlies said interior space in which said means coacting between said flange portion and said inner panel comprises a mechanical fastening device, said inner panel is provided with a hole through which said mechanical fastening device passes, a light reflective means is cooperatively associated with said edge guard along the inner panel and is disposed to overlie said mechanical fastening device, said light-reflective means comprising means providing an internal reflection of incident light so that light is reflected back along the direction of incidence.

4,587,763

GRINDING MACHINE

Robert S. Hahn, 26 Rice Ave., Northboro, Mass. 01532

Continuation of Ser. No. 467,394, Feb. 17, 1985, abandoned.
This application Jun. 12, 1985, Ser. No. 744,132
Int. Cl.[4] B24B 5/00
U.S. Cl. 51—5 D 6 Claims



1. Grinding machine, comprising:

(a) a base on which is mounted a rotatable table for carrying a workpiece having a surface of revolution to be finished,

(b) a wheelhead mounted on the base and carrying a rotatable abrasive wheel for finishing the surface of revolution,

(c) a dresser mounted on the base for receiving the operative surface of the abrasive wheel;

(d) a reference plate mounted on the table but thermally isolated therefrom by means of insulating pads extending between the reference plate and the table, the plate having a cylindrical contact surface which is coaxial with the axis of rotation of the table, and

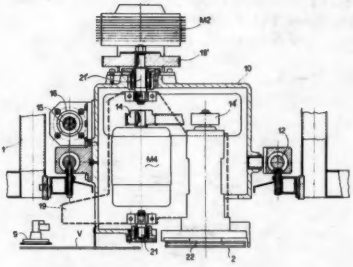
(e) means mounted at the base supplying constant temperature fluid through passages in the reference plate to maintain its temperature at a uniform value and to minimize expansion and contraction.

4,587,764

MACHINE FOR GRINDING THE EDGES OF A SHEET OF GLASS

Massimo Leone, Vasto, and Francesco Torre, Pescara, both of Italy, assignors to Societa Italiana Vetro SIV S.p.A., Vasto, Italy

Filed Apr. 24, 1984, Ser. No. 603,651
Claims priority, application Italy, May 11, 1983, 48269 A/83
Int. Cl.[4] B24B 9/10
U.S. Cl. 51—33 W 2 Claims



1. In a machine for grinding the edges of a sheet of glass including a chassis, a horizontally sliding carriage engaged with said chassis by means of a screw coupling and a rotatable shaft for supporting said sheet of glass, the improvement comprising in combination:

a first motor fixed to said chassis for rotating said shaft by 360° around a vertical axis perpendicular to said sheet; a wheel arm pivotally supported on said carriage having a vertical rotation axis; a torque motor supported on said carriage for controlling the angular position of said wheel arm with respect to said carriage; a vertical mandrel rotatably supported on said wheel arm, said mandrel having a powered grind wheel at one free end thereof, a bidirectional motor supported on said chassis for controlling the horizontal displacement of said carriage; and an electronic processor for memorizing a profile of the sheet of glass and for generating instantaneous pulses to control said first motor, said torque motor and said bidirectional motor, said instantaneous pulses being a function of the relative position of the grindwheel and the edge of the sheet of glass, whereby the operating parameters of said motors are established for each small section of the sheet edge.

4,587,765

METHOD OF AN APPARATUS FOR GRINDING WORK SURFACE

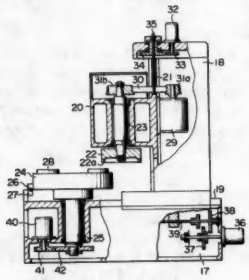
Satoshi Matsui, Ebina, Japan, assignor to Hitachi Seiko, Ltd., Tokyo, Japan

Continuation of Ser. No. 358,675, Mar. 16, 1982, abandoned. This application Feb. 17, 1984, Ser. No. 581,269

Claims priority, application Japan, Mar. 16, 1981, 56-36469

Int. Cl.⁴ B24B *7/02*

U.S. Cl. 51—56R **10 Claims**



3. A grinding apparatus comprising a table for mounting at least four workpieces, at least two spindle head means each rotatably carrying a spindle having a grinding wheel mounted thereon, a first driving means for rotatably driving said grinder spindles, a column means for supporting said spindle head means for vertical sliding movement therealong, said column means having a thermal distortion direction, a second driving means for causing the vertical sliding movement of said spindle head means along said column means to thereby effect a cutting by said grinding wheel into two of said workpieces, bed means for carrying said column means for horizontal sliding movement in the direction of thermal distortion of said column means, said column means supporting said at least two spindle means on said bed means so as to enable a simultaneous horizontal sliding movement of said grinding wheels in said thermal distortion direction of said column means so as to enable a simultaneous grinding of two workpieces on said table by the respective grinding wheels, and third driving means adapted to move said column means horizontally in a direction of said thermal distortion of said column means to thereby grind the workpieces on said table by said grinding wheels.

4,587,766

SYNCHRONOUS OPERATION CONTROL APPARATUS IN GRINDING MACHINES

Satoshi Miyatake, Kawagoe; Mitsuo Abe, Kiyose, and Masao Kume, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 8, 1984, Ser. No. 638,688

Claims priority, application Japan, Aug. 9, 1983, 58-146025

Int. Cl.⁴ B24B *19/00*

U.S. Cl. 51—95 GH **4 Claims**

1. A synchronous operation control apparatus for operating a rotating tool and a rotating workpiece in synchronism, comprising:

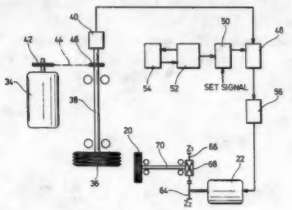
(a) a pulse generator for generating pulses at a first frequency dependent on the speed of rotation of the tool;

(b) a workpiece motor operatively coupled to a rotating shaft of the workpiece for rotating the workpiece;

(c) an adjustable frequency divider connected to said pulse generator to produce drive pulses at an adjustable second frequency;

(d) means for energizing said workpiece motor at a speed represented by the second frequency; and

(e) a memory connected to said frequency divider and storing data to correct an error produced when said frequency divider frequency-divides the pulses generated by said pulse generator, the arrangement being such that the



second frequency is adjusted on the basis of the stored data to produce a prescribed number of pulses to energize said workpiece motor.

4,587,767

APPARATUS FOR GRINDING

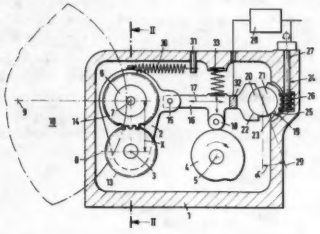
Karl Giebmanns, Berlin, Fed. Rep. of Germany, assignor to Buderus Aktiengesellshaft, Wetzlar, Fed. Rep. of Germany

Filed Sep. 21, 1981, Ser. No. 304,079

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1980, 3036153

Int. Cl.⁴ B24B *19/08*

U.S. Cl. 51—101 R **10 Claims**



1. An arrangement for relief grinding and polygonal grinding on grinding machines, comprising: a machine housing; a grinding disk on said machine housing for grinding a workpiece, said grinding disk having a disk axis; a workpiece spindle shaft with axis parallel to said grinding disk axis, said workpiece spindle shaft mounting the workpiece; a journal body, with a pivot axis in said housing, mounting the spindle shaft and an articulated lever mounted on said journal body, said lever having a free end; cam means actuating said lever to generate an articulated movement for controlling oscillating engagement of the workpiece with said grinding disk; means for converting said articulated movement of said lever into a linear movement of the lever lengthwise of the longitudinal axis thereof, said lever engaging said journal body at a predetermined distance from said journal body pivot axis, said means for converting said articulated movement of said lever into a linear movement of the lever comprising sliding means having two mutually adjustable glideface elements, one of said elements being mounted on said machine housing and the other one of said elements being mounted on the free end of said lever.

4,587,768

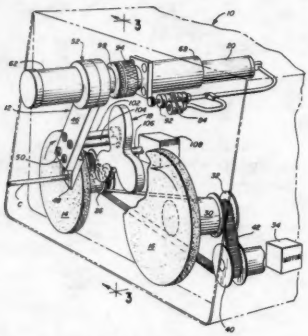
APPARATUS AND METHOD FOR POLISHING ENDS OF FIBER OPTICS

Ralph R. Doyle, Arlington Heights, Ill., assignor to Buehler Ltd., Lake Bluff, Ill.

Continuation-in-part of Ser. No. 555,806, Nov. 28, 1983, abandoned. This application Apr. 27, 1984, Ser. No. 604,898

Int. Cl.[4] B24B *7/00*

U.S. Cl. 51—124 R **17 Claims**



1. Apparatus for polishing the end of a fiber optic member comprising, in combination, movable polishing means having an abrasive surface for polishing said fiber optic member when the latter is urged into engagement with said abrasive surface, movable support means for holding said fiber optic member and advancing the same into engagement with said abrasive surface, and force-applying means for controlling the movement of said movable support means toward said abrasive surface, said force-applying means including first means for applying a force to said movable support means toward said abrasive surface, and second means comprising compressible means between said first means and said movable support means, whereby upon operation of said force-applying means said fiber optic will initially engage said abrasive surface with a relatively low force which gradually increases to a maximum as said force-applying means continues to advance said movable support means toward said abrasive surface and thereby compresses said second means.

4,587,769

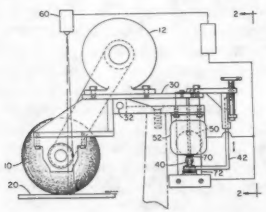
GRINDING WHEEL WEAR COMPENSATION SYSTEM

William P. Cathers, Allison Park, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 21, 1985, Ser. No. 736,606

Int. Cl.[4] B24B *49/00*

U.S. Cl. 51—165.87 **20 Claims**



1. An apparatus for grinding a substrate wherein contact between the substrate and grinding means is maintained automatically as the grinding means wears away comprising:

a. a fixed support;

b. a frame movably mounted on said fixed support;

c. grinding means mounted on said frame;

d. adjustment means mounted on said fixed support;

e. a stop mounted on said frame which restricts the movement thereof to a set distance between said stop and said adjustment means;

f. a switch mounted on said frame such that upon movement of said frame said switch is closed before said stop contacts said adjustment means;

g. means for adjusting the position of said adjustment means electrically connected to said switch; and

h. means for sensing the presence of a substrate at the position of said grinding means and electrically overriding said switch so that said means for adjusting the position of said adjustment means is activated by said switch only when said sensing means concurrently senses the presence of a substrate at the position of said grinding means.

4,587,770

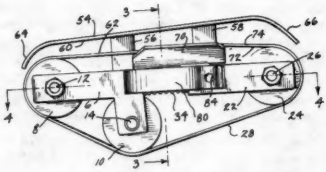
BELT SANDER ATTACHMENT FOR A PORTABLE DRILL

Robert C. Lindberg, Rte. 2, Box 306R, Dorchester, Wis. 54425

Filed May 31, 1984, Ser. No. 616,561

Int. Cl.[4] B24B *23/06, 21/02*

U.S. Cl. 51—170 EB **11 Claims**



1. A belt sander comprising:

a frame;

a drive roller rotatably mounted to said frame;

an idle roller rotatably mounted to said frame;

a carriage movably mounted to said frame;

a second idle roller rotatably mounted to said carriage, said rollers forming a triangular configuration for receiving an endless loop sanding belt therearound, said rollers being interior of said sanding belt;

belt tensioning means comprising biasing means bearing between said frame and carriage and biasing said carriage rectilinearly away from said frame to tension said belt,

said sanding belt having a flexible span between at least two of said rollers, providing a sanding belt which flexes inwardly such that its outer surface curves when applied against curved nonplanar sanding surfaces;

wherein said biasing means comprises compression spring means lying along the rectilinearly biased path of movement of said carriage, and wherein said sanding belt has a first flexible span between said first idle roller and said second idle roller, and a second flexible span between said first idle roller and said drive roller;

wherein said carriage and second idle roller are biased along a straight line between said drive roller and said second idle roller, and said compression spring means lies along said straight line;

and comprising a combined guard plate and pressure guide mounted to said frame and extending around an edge of said belt and having an inner surface facing said outer surface of said belt and spaced outwardly away therefrom and extending substantially the length of said straight line between said drive roller and second idle roller, and having an outer surface engageable by a user's hand or the like for guidance and application of pressure, said combined

guard plate and pressure guide applying sanding pressure to each of said spans against respective sanding surfaces.

4,587,771

PROCESS FOR THE BACKSIDE-GETTERING SURFACE TREATMENT OF SEMICONDUCTOR WAFERS

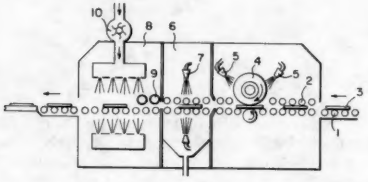
Alfred Buchner, Pischelsdorf, Austria; Franz Kuhn-Kuhnenfeld, Emmerting, and Walter Auer, Burghausen, both of Fed. Rep. of Germany, assignors to Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH, Burghausen, Fed. Rep. of Germany

Filed Sep. 22, 1982, Ser. No. 421,452

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1981, 3148957

Int. Cl.⁴ B24B *1/00*

U.S. Cl. 51—281 SF **13 Claims**



1. A process for the backside-gettering surface treatment of semiconductor wafers by means of mechanical stress, comprising the step of:

linearly feeding the wafers on longitudinally-extending conveyor means in an unattached but supported condition, past at least one moving carrier body, the surface of which is provided with an elastic carrier medium to which an abrasive grain is bonded, so as to create mechanical stress and, in turn, rear-surface damage to said wafer having a rear-gettering effect.

4,587,772

DISPENSER FOR A JET OF LIQUID BEARING PARTICULATE ABRASIVE MATERIAL

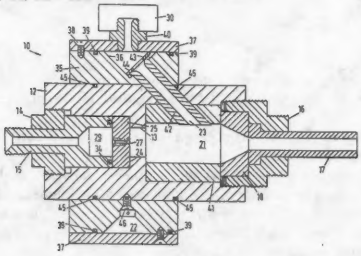
Norman J. Griffiths, Shelton Lock, England, assignor to National Research Development Corporation, London, England

Continuation of Ser. No. 263,324, May 13, 1981, Pat. No. 4,449,332, which is a continuation of Ser. No. 62,570, Jul. 31, 1979, abandoned. This application Mar. 6, 1984, Ser. No. 587,021

The portion of the term of this patent subsequent to May 22, 2001, has been disclaimed.

Int. Cl.⁴ B24C *5/04*

U.S. Cl. 51—439 **9 Claims**



1. In a dispenser for a dispensing a jet of liquid bearing particulate abrasive material, comprising in combination:

a hollow body defining a bore,

liquid inlet means at one end of the bore,

outlet means at the other end of the bore for discharging the liquid bearing particulate abrasive material,

a mixing chamber, larger in radial dimension than the outlet means, disposed between the liquid inlet means and the outlet means,

abutment means provided within the bore, between said one end of the bore and the mixing chamber, so as to face said one end of the bore;

a nozzle holder seated against the abutment means,

at least one inlet nozzle mounted in the nozzle holder for directing a flow of liquid through the mixing chamber along the first axis, said inlet nozzle being dimensioned and arranged so that, in use of the dispenser, the radial cross-section of the flow of liquid through the mixing chamber is smaller than the cross-section of the mixing chamber,

said inlet nozzle having a discharge end lying within the mixing chamber at a fixed axial location relative to the direction of the flow of liquid,

a controllable supply means for providing a metered feed of particulate abrasive material to a supply chamber,

passage means for transferring the particulate material from the supply chamber to the mixing chamber and comprising at least three passages which are equally angularly disposed around said bore and which respectively extend along second axes which intersect with the direction of flow of the liquid at an angle that is between 0° and 90° with said second axis converging with the direction of the flow of the liquid,

entry ports in the wall of the mixing chamber by which separate flows of particulate material leave the passages along said second axis and enter the mixing chamber, the entry ports defining and lying in a common plane transverse to the direction of flow of the liquid and lying at a second axial location relative to that direction and axially downstream relative to said first axial direction,

said mixing chamber having a portion of substantial axial length as defined between said first and second axial locations wherein the flow of liquid directed by said inlet nozzle travels within the mixing chamber wherein no particulate material flows after entering the mixing chamber by way of the entry ports due to said entry ports being at the downstream axial end of said portion, and

said first and second axes intersecting within said mixing chamber downstream of said downstream axial end of said portion, whereby said flow of liquid and said separate flows of particulate material meet within said mixing chamber in the region of said intersection.

4,587,773

SEISMIC PROTECTION SYSTEMS

Hector A. Valencia, Cerro Gordo 44, Mexico 21. DF., Mexico

Continuation-in-part of Ser. No. 457,582, Jan. 13, 1983, abandoned. This application Apr. 12, 1985, Ser. No. 722,409

Int. Cl.⁴ E04H *9/00*

U.S. Cl. 52—1 **13 Claims**

1. A seismic protection system for a structure which comprises

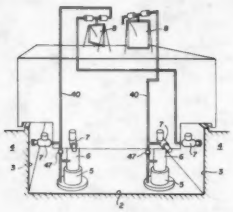
a foundation plate with retaining walls for supporting and isolating a structure from ground;

oscillatory means between said foundation plate and the structure for permitting horizontal movement of the structure relative to said foundation plate, said oscillatory means comprising fluid confining means;

vibratory means coupled to said oscillatory means for permitting relative vertical movement between said foundation plate and the structure and for dampening and transferring structure loads to said oscillatory means;

hydro-pneumatic means with a surge chamber for permitting and controlling relative movement between the structure and said retaining walls;

friction means for preventing horizontal movement of the structure caused by wind; and



wind driven pressure generating means mounted on the structure and in fluid communication with said oscillatory means, said vibratory means and said hydro-pneumatic means.

4,587,774

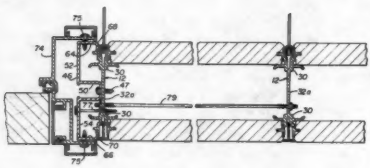
SYSTEM ADAPTED TO SUPPORT A CANTILEVERED LOAD AT A PARTITION BREAK

Alan C. Wendt, Barrington, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Continuation-in-part of Ser. No. 551,424, Nov. 14, 1983, Pat. No. 4,570,390. This application Sep. 9, 1985, Ser. No. 773,780

Int. Cl.⁴ E04B *2/00*

U.S. Cl. 52—36 **13 Claims**



1. A cantilevered load support system for a partition comprising wallboards having kerfed edges, said system comprising:

an upright metal stud comprising

a longitudinal web having a central plate portion and a furcated channel housing portion along each longitudinal edge of the plate,

a first flange extending laterally from each furcated portion and adapted to extend into a kerfed edge of a wallboard, and

a second flange extending from each furcated portion in the laterally opposite direction relative to the first flange;

each furcated portion defining a longitudinal, two-tiered channel, the housing of the first tier being proximate to the plate and having confronting facets adapted to engage the threads of a screw, the second tier being wider than the first and having an unobstructed mouth distal to the plate;

an upright, generally E-shaped rail in longitudinal alignment with the stud, said rail having a first web, a second web, a yoke connecting the webs, a unilateral flange extending from each web, and a terminal return extending toward the yoke from each such flange, so that the second flanges of the stud and the terminal returns are frictionally engaged; and

a frontally removable slotted standard within the second tier of a furcated channel of the stud and fastened to the housing of the first tier.

4,587,775

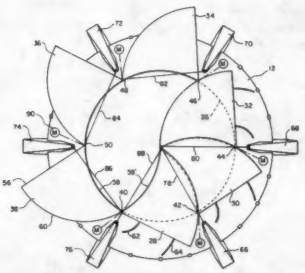
RETRACTABLE CLOSURE FOR ROOF OPENING

Roger E. Lewis, and Webb W. Hayes, Jr., both of Orinda, Calif., assignors to Earl & Wright, San Francisco, Calif.

Filed Jul. 18, 1984, Ser. No. 631,872

Int. Cl.⁴ E04B *7/16*

U.S. Cl. 52—65 **9 Claims**



1. A retractable closure for an opening in the roof of a building structure, including a plurality of roof panels positioned on the roof outside the roof opening, means for mounting the panels on the roof at respective upright pivot axes for pivotal movement across the opening between opened and closed positions, said pivot axes being spaced at intervals about the periphery of the roof opening, with each of the panels being sized and shaped to extend across a portion of the opening when the panels are in the closed position and with the roof opening substantially unobstructed when the panels are in the open position, means for pivoting the panels across the opening, and means for vertically supporting the panels when they are over the opening.

4,587,776

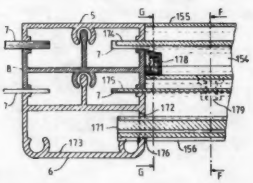
ROOFING STRUCTURE

Ghislain Leurent, Tourcoing, France, assignor to Brelan S.A., Luxembourg-Ville, Luxembourg

Filed Feb. 15, 1983, Ser. No. 466,471

Int. Cl.⁴ E04B *1/32, 7/18*

U.S. Cl. 52—86 **6 Claims**



1. Roofing structure for covering a zone located between two suports generally parallel in a longitudinal direction, comprising:

a plurality of juxtaposed supple roofing plates located on at least one level;

hoop elements positioned transversally between said two longitudinal supports, each of said hoop elements comprising at least two elementary hoop elements including a lower hoop element and an upper hoop element superposed on the lower hoop element;

said roofing plates each having transverse edges engaged between said lower and said upper hoop elements of each pair;

connecting crosspieces between said hoop elements and extending perpendicularly thereto;

said connecting crosspieces being superimposed sections comprising mutual guiding means between which are engaged the longitudinal edges of said roofing plates; and means for deforming one of said superposed elementary hoop elements with respect to the other arranged to bring about assembly of said sections constituting said connecting crosspieces.

4,587,777

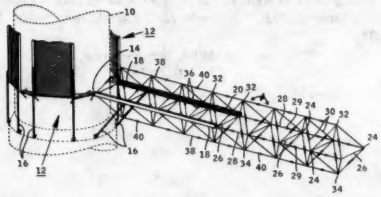
DEPLOYABLE SPACE TRUSS BEAM

Anthony J. Vasques, and Raymond F. Crupi, both of San Diego, Calif., assignors to General Dynamics Corporation/Convair Div., San Diego, Calif.

Continuation-in-part of Ser. No. 318,194, Oct. 9, 1981, abandoned. This application Dec. 13, 1984, Ser. No. 681,352

Int. Cl.⁴ E04H *12/18*

U.S. Cl. 52—108 **12 Claims**



1. A deployable truss beam assembly movable between a tightly packed position and a deployed truss position comprising;

a pair of substantially parallel guide rails having guide means on their opposed surfaces, said guide rails having a length less than the length of said truss beam in the deployed position and longer than the length of said truss beam in the packed position;

a plurality of horizontal node fittings engaging said guide means for movement along and relative to said rails;

side longitudinal struts connected to and extending between each adjacent pair of horizontal node fittings along each guide rail;

cross struts connected to and extending between corresponding horizontal node fittings on opposite guide rails;

upper and lower node fittings spaced above and below said guide rails along lines equidistant from both rails;

diagonal struts connected to and extending from said horizontal node fittings to connections at said upper and lower node fittings to form diamond trusses;

upper and lower longitudinal struts connected to and extending between adjacent pairs of said upper node fittings and between adjacent pairs of said lower node fittings;

hinge means inserted at approximately the midpoint of each of said side upper and lower longitudinal struts and half of said diagonal struts so that each of those struts may be folded inwardly from a substantially straight line arrangement to a fully folded arrangement where the portions of said strut adjacent to said hinge are substantially parallel when said truss is moved from a deployed to a packed arrangement where all of said struts and strut portions are substantially parallel to each other.

4,587,778

METHOD AND APPARATUS FOR ERECTING A DRILLING RIG MAST

Homer J. Woolslayer, and Cecil Jenkins, both of Tulsa, Okla., assignors to Lee C. Moore Corporation, Tulsa, Okla.

Filed Oct. 5, 1984, Ser. No. 658,352

Int. Cl.⁴ E04H *12/34*

U.S. Cl. 52—116 **21 Claims**

1. A method for mounting a mast on a substructure having a drawworks mounted thereon comprising the steps of:

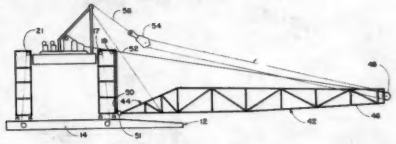
placing the mast in a horizontal position with the foot of the mast being adjacent the lower portion of the substructure;

pivotally attaching the foot of the mast to the lower portion of the substructure;

connecting the drawworks cable to the mast;

pivoting the end of the mast upwardly about the foot of the mast by reeling in drawworks cable;

detaching the foot of the mast from the lower portion of the substructure;



raising the foot of the mast to a point on the substructure at which it is to be secured for drilling or other operations while maintaining the end of the mast in its raised condition with the drawworks cable;

pivotally attaching the foot of the mast to said point; and

further pivoting the end of the mast upwardly about the foot of the mast to the position in which it is to be used for drilling or other operations.

4,587,779

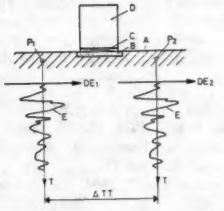
SYSTEM FOR PROTECTING A BODY FROM MOTIONS TRANSMITTED THROUGH THE GROUND

Konrad Staudacher, Zurich, Switzerland, assignor to Seisma AG., Zurich, Switzerland

Continuation of Ser. No. 263,458, May 15, 1981, abandoned. This application Aug. 26, 1985, Ser. No. 769,794

Int. Cl.⁴ E04H *9/02*; E02D *27/34*

U.S. Cl. 52—167 **13 Claims**



1. In a body, integrally protected against damage from motions transmitted through the ground; said motions being measurably expressed in form of a design response spectrum having a predominant resonance range where acceleration amplitudes are highest, said motions being transmitted by mechanical isolators which three-dimensionally yieldingly connect the body to a base, the base being rigidly linked to a surrounding formation, the combined body and isolators having a series of structural frequencies including a set of six lower, fundamental structural frequencies and a set of upper structural frequencies, the improvement comprising:

means providing the combined body and isolators with a gap in said series of structural frequencies of the combined body and isolators, said gap lying between the highest of said six fundamental structural frequencies and the lowest of said upper structural frequencies of the combined body and isolators, said means being further formed to select said gap so that said gap falls within said resonance range of said design response spectrum, whereby the body is devoid of structural frequencies within said resonance range of said design response spectrum and is thereby

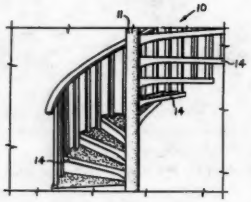
isolated from corresponding high amplitude motions transmitted through the ground.

4,587,780

SPIRAL STAIRCASE

Andrew J. Rorke, Revesby, Australia, assignor to Ebb Tide Pty., Ltd., Revesby, Australia

Filed Nov. 28, 1983, Ser. No. 555,452
Int. Cl.[4] E04F *11/00*
U.S. Cl. 52—187 **3 Claims**



1. A spiral staircase comprising:

a central hollow column of a circular cross-sectional shape, said column having a wall, an outer face, an inner face and a plurality of apertures in the wall spaced spirally thereabout, and

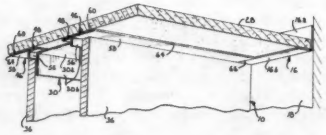
a plurality of treads, each said tread having an inner end with a curved locking plate thereat which lies contiguous with the outer face of the column and a locking pin projecting radially inwardly from the locking plate and extending through a respective aperture in the wall of the hollow column, each said locking pin having surfaces defining an upwardly extending slot which accommodates a portion of the column wall, said slot surfaces being curved both in plan and in end elevation and having curvatures which conform with the curvatures of the complementary faces of the column which they engage when the locking pin is inserted into a respective aperture in the column, one of said slot surfaces bearing against the inner face of the column thereby inhibiting tilting of that tread.

4,587,781

TRIM PIECE FOR SUSPENDED CEILINGS

Larry G. Uttley, and Franklyn L. Webb, both of 8314 Spring Valley, Belton, Mo. 64012

Filed May 7, 1984, Ser. No. 607,582
Int. Cl.[4] E04H *1/00*
U.S. Cl. 52—242 **20 Claims**



1. A trim member for application to a joint between a suspended ceiling tile supported on flanges of a pair of overhead T-bars and a vertical partition oriented transversely to the T-bars and formed by wallboard covering an overhead wall track having a flange portion and a web portion extending between the T-bars against the undersides of their flanges, said trim member comprising:

a generally flat body portion having a length to extend between the flanges of the T-bars and a size to fit closely between the ceiling tile and the web portion of the wall track;

a tongue portion projecting from said body portion and oriented generally perpendicular thereto, said tongue portion being adapted for placement between the flange portion of the wall track and the wallboard to retain the trim member in a stationary position; and

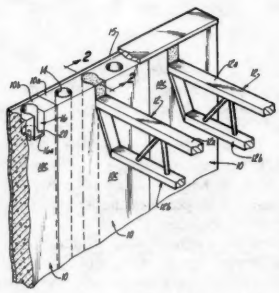
a generally flat flange element having substantially the same thickness as the flanges of the T-bars and having a length to extend between the flanges in butting relation thereto, said flange element extending from said body portion at a location to extend through the joint between the ceiling tile and wallboard and along the underside of the ceiling tile beyond the wallboard, said flange element being permanently attached to said body portion and having a finished surface which remains exposed following application of the trim member to the joint.

4,587,782

BEARING WALL AND JOINT CONSTRUCTION

Calvin Shubow, 30205 Summit Dr., Farmington Hills, Mich. 48018

Filed Sep. 10, 1984, Ser. No. 649,179
Int. Cl.[4] E04B *2/58*
U.S. Cl. 52—251 **12 Claims**



1. A building construction comprising:

A. at least one precast concrete wall slab positioned vertically and having at least one core channel extending vertically therethrough from the lower edge thereof to the upper edge thereof between outer and inner faces thereof;

B. a vertical slot, formed in said slab in alignment with said core channel, extending vertically from the upper edge of said slab downwardly into said slab for a distance corresponding to a minor fraction of the total height of the slab and laterally from said core channel to said inner face of said slab; and

C. a joist positioned in the bottom of said slot with its one end positioned in said core channel.

4,587,783

PANEL JOINING METHOD APPARATUS

Patrick A. McCoy, and Roy J. Reese, both of Tulsa, Okla., assignors to Nordam, Tulsa, Okla.

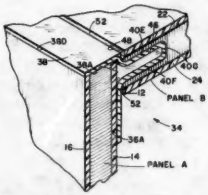
Filed Aug. 16, 1984, Ser. No. 641,271
Int. Cl.[4] E04B *1/00*
U.S. Cl. 52—282 **4 Claims**

1. Apparatus for use in joining panel A to panel B to form a corner joint, each panel being of selected thickness between opposed panel surfaces and having edges therearound, panel B having a recess of selected width cut in the edge to be joined, the recess being intermediate the opposed panel surfaces, the apparatus comprising:

an elongated structural reinforcing and joining member configured in cross-section by a thin, rectangular base portion having planar inner and outer surfaces, the inner

surface being adaptable to be bonded to one surface of panel A, and having opposed paralleled edges;

an end portion integrally extending from one edge of said base portion and perpendicular to said base portion inner surface, the end portion having an inner and outer planar surface and having opposed paralleled edges, the first of such edges being in coincidence with one edge at said base portion, the inner surface adaptable to being bonded to an edge of panel A, the second edge being spaced from said



base portion inner surface a distance substantial the thickness of said panel A; and

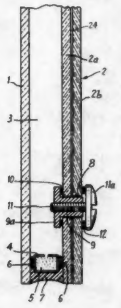
an integral T portion extending from said base portion outer surface and in a plane parallel the plane of said end portion, the thickness of the T portion being less than the thickness of panel B and slightly less than the width of said recess formed in the edge of panel B, the plane of said T portion drawn intermediate its thickness being offset from the plane of the outer surface of said end portion by an amount equal about ½ of the thickness of panel B.

4,587,784

FLAME-RESISTING GLAZING PANELS

Pierre P. R. Chavy, Mareil Marly, and Jean-Claude Legrand, Forges-les-Eaux, both of France, assignors to Conforglace S.A., Gaillefontaine, France

Filed Dec. 12, 1983, Ser. No. 560,392
Claims priority, application France, Nov. 20, 1982, 82 21298
Int. Cl.⁴ E06B *3/26*
U.S. Cl. 52—304 **16 Claims**



1. A glazing panel comprising:

at least one flame-resisting first glazing for defining a volume or a premises in which a fire may break out,

at least one mechanicaly strong second glazing disposed on a side of said first glazing opposite to the premises and parallel to said first glazing,

a separate seating element between said first glazing and said second glazing which defines an internal hermetic volume containing a layer of gas,

an aperture provided in said second glazing, and

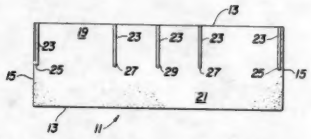
a plug made from a material which is fusible at a relatively low temperature of about 70° to 150° C. which hermetically closes said aperture.

4,587,785

ROOFING SHINGLES

Nicholas J. Rohner, Delhi, N.Y. 13753

Filed Jun. 25, 1984, Ser. No. 624,099
Int. Cl.⁴ E04B *2/00*
U.S. Cl. 52—420 **3 Claims**



1. A pair of coordinated roofing shingles for use in covering a roof by placing a series of rows of shingles with each two overlapping the adjacent lower row on the roof, said pair of shingles comprising:

a full-size shingle including a flat sheet of weather resistant material having a rectangular shape with two minor edges having a length, two major edges, and an upper portion and a lower portion, the major edges of the full-size shingle being substantially three times the length of the minor edges of the full-sized shingle, said full-size shingle further including five adhesive bands, each of the five adhesive bands being generally parallel with the two minor edges of the full-size shingle and located in the upper portion of the full-size shingle, two of the adhesive bands being located adjacent the minor edges of the full-size shingle and two of the adhesive bands being located with one edge a distance of one-third the length of each major edge from opposite minor edges and and one single adhesive band being located along the centerline of the full-size shingle; and

a half-size shingle including a flat sheet of weather resistant material having a rectangular shape with two minor edges each edge having a length and two major edges and an upper portion and a lower portion, the major edges of the half-size shingle being substantially one and one half times the length of the minor edges of the half-size shingle, the minor edges of both the half-size shingle and the full-size shingle being substantially the same, said half-size shingle further including two adhesive bands, each of the two adhesive bands being generally parallel with the two minor edges of the half-size shingle and being located adjacent the minor edges of the half-size shingle for the full length of the minor edges of the half-size shingle, the upper portion of both the full-size shingle and the half-size shingle being adapted to be covered by the next higher row of shingles and the lower portion of both the full-size shingle and the half-size shingle being adapted to be exposed, said full-size shingle and said half-size shingle being adapted to be alternated in the same row with each full-size shingle having a half-size shingle centrally aligned with a full-size shingle in the next higher row.

4,587,786

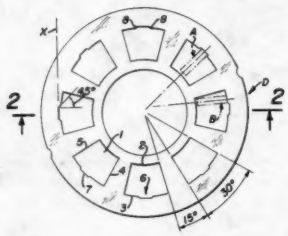
SCAFFOLDING AND LOCKING DISCS THEREFOR

Neil W. Woods, Mississauga, Canada, assignor to Anthes Equipment Limited, Mississauga, Canada

Filed Sep. 21, 1984, Ser. No. 653,508
Claims priority, application Canada, Oct. 26, 1983, 439784
Int. Cl.⁴ E04H *12/00*
U.S. Cl. 52—638 **8 Claims**

1. Scaffolding including a plurality of substantially vertically extending and vertically adjustable support members; at least one locking disc secured to each vertical support, said disc having a plurality of radially extending locking apertures; each said aperture being defined by a pair of spaced inner and outer surfaces of said disc joined together and spaced apart by a pair of spaced generally radially outwardly extending surfaces of

said disc; each of said outer surfaces of said disc having a recess therein, the radially outermost surface of which extends at an angle of substantially 90° to a radius extending centrally through said outermost surface of the disc, said outer surface being connected to the radially outermost surface by a pair of mutually opposed end surfaces; a plurality of brace members



opposite ends of which each have a slot adapted to receive a portion of an associated said disc; and a locking wedge capable of pivoting within each said opposite end and capable of being driven substantially downwardly into said end and a selected said locking aperture to lock said end to said associated disc, each said wedge selectively engaging an associated said end of a brace member and said outer surface of a locking aperture.

4,587,787

BUILDING SYSTEM

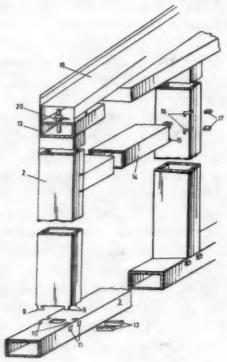
Thomas G. King, 196 Currie Road., Durban, Natal, South Africa

Filed Oct. 7, 1983, Ser. No. 540,052

Claims priority, application South Africa, Oct. 8, 1982, 82/7377

Int. Cl.⁴ E04H *12/00*

U.S. Cl. 52—648 **3 Claims**



1. A building system comprising:

at least two structural elements each including a vertically elongated hollow member constructed and arranged to be anchored alternately on a base plate and a hollow body, by including at least one axial projection constructed and arranged for direct engagement with a corresponding formation on the base plate or hollow body for rigidly securing the structural element to the base plate or hollow body;

means for displacing at least one of said at least one projection on each said structural element into a seating position in which said hollow members are locked to said base plate or hollow body; and

a pressed sheet metal cladding panel having an outer periphery, this panel being constructed and arranged to be joined with at least one like panel in a lapped edge-over-edge relationship, by including:

a recessed peripheral zone bordering at least one edge portion of the outer periphery of such panel, and

a slit extending across said one edge portion, said slit being sized and positioned to receive a correspondingly recessed one edge portion of such like panel;

said cladding panel being constructed and arranged to be attached to at least two of said structural elements

said cladding panel being rectangular;

said recessed peripheral zone extending about all of said outer periphery of the cladding panel including both side edges and both end edges thereof;

said one edge of said cladding panel being an end edge;

said slit being disposed to coincide with an imaginary linear projection of the medial margin of said peripheral zone along a respectively adjoining said side edge of said cladding panel;

said at least one projection one each said vertically elongated hollow member comprising four tongues arranged in a rectangular pattern, these tongues being constructed and arranged to be seated in four openings correspondingly formed in said base plate or hollow body; and

said displacing means comprising wedge-shaped body means constructed and arranged to mount to said base plate or hollow body while wedgingly bearing against two of said four tongues.

4,587,788

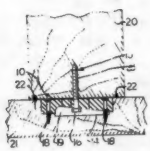
FASTENING DEVICE

Michael D. Bielicki, 26283 Olinda Trail, Lindstrom, Minn. 55045

Filed Apr. 11, 1983, Ser. No. 483,692

Int. Cl.⁴ E04B *1/00;* **E04H** *17/141*

U.S. Cl. 52—698 **9 Claims**



1. A concealable fastening device for rigidly and adjustably securing in a flush arrangement the end portion of a first structural member having a flat end surface to the surface of a second structural member also having a flat surface portion and further having a recessed portion with a predetermined peripheral depth therein, said concealable fastening device having a configuration to minimize the moment of force between the first and second structural members, said device comprising:

(a) an elongated, unitary, rigid member having opposing end portions, one end portion for securement into the end surface of a first structural member, and the opposite end portion being a widened head having a generally flat, non-movable bottom surface, said elongated rigid member further having a shaft portion with a generally uniform cross-section extending downward from said widened head end portion,

(b) means for adjustably securing the opposite end of said elongated, rigid member into the end portion surface of the first structural member so as to be rigid therewith, said means to permit length adjustability of the uniform shaft portion to control the spacing of the widened head portion relative to the end portion surface of the first structural member,

(c) a solid and rigid plate member consisting essentially of a

rigid and unyielding body member of a steel construction for insertion and securement in the recessed portion of the second structural member, said plate member having a flat and generally continuous upper surface for contact with the end surface of the first structural member and being dimensionally smaller than the end surface of the first structural member end surface for concealing the device when in use, said plate member further having a predetermined uniform thickness at at least its opposing ends so that the plate member, when placed on the peripheral portion in the recessed portion of the second structural member, can be drawn in a flush configuration with the end surface of the first structural member to minimize the moment of force between the members, said plate member further having one elongated, slotted, and inclined bottom surface apertured portion having a uniform slope extending therethrough for slidably receiving said head portion and uniform shaft portion of said elongated, rigid member, and,

(d) means for securing said plate member within the recessed portion of a second structural member so that the upper surface of said plate member is generally flush with the surface of a second structural member, whereby, subsequent to adjustably securing said elongated, rigid member to a first structural member, and securing said plate member within a recessed portion of a second structural member, a user is able to insert the nonmovable head portion of said unitary, rigid member into the elongated, slotted portion of said plate member, to secure in a flush arrangement two structural members by slidably forcing said head portion along the inclined bottom surface aperture of said solid plate member to secure the end portion surface of the first structural member to the upper surface of said solid plate member, to thereby, conceal said fastening device between said first and second structural members and to rigidly secure said structural members in a flush configuration to minimize the moment of force between them.

4,587,789

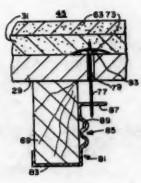
ANCHORING MEANS FOR A PREFABRICATED ROOF OR SIDING PANEL

Gerry Tomason, 540 SE. Corliss, Corvallis, Oreg. 97333

Division of Ser. No. 496,195, May 19, 1983, Pat. No. 4,544,595. This application Aug. 31, 1984, Ser. No. 646,067

Int. Cl.⁴ E04B *1/38*

U.S. Cl. 52—713 **1 Claim**



1. A mechanism for anchoring a pre-fabricated panel to structural members such as roof trusses or wall studs comprising

an elongated knurled retaining rod projecting from the underside of said prefabricated panel, and

a retaining bracket having a first end portion sized to fit over and secure to a panel supporting structural member, a second end portion

having an extension wall extending from one side of said first end portion, and a base plate secured to said extension wall

having a star fastener opening therein whereby said retaining bracket base plate can be lockingly forced onto the end of said knurled retaining rod to lockingly engage said retaining bracket and thereby said panel to said structural member, said side wall extension having a flexure portion to permit flexing of said second end portion in the plane of said extension wall to provide a spring restoring force against said knurled rod.

4,587,790

APPARATUS FOR THE STORAGE OF FLAT PRODUCTS ARRIVING IN AN IMBRICATED FORMATION, ESPECIALLY PRINTED PRODUCTS

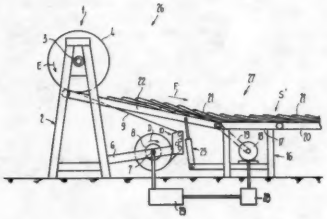
Erwin Müller, Dürnten, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Filed Oct. 4, 1982, Ser. No. 432,557

Claims priority, application Switzerland, Oct. 12, 1981, 6503/81

Int. Cl.⁴ B65B *63/04*

U.S. Cl. 53—118 **18 Claims**



1. An apparatus for the storage of flat products, especially printed products, arriving in an imbricated product formation, comprising:

a rotatably mounted and driveable winding core to which there are infed from below the products which are conveyed towards the winding core;

at least one rotatable supply spool for a separation band traveling beneath a predetermined path of travel of the products;

said separation band being connected at one end with the winding core and during the winding-up of the products being fed from below to the winding core and being subjected to a tensional load;

a common mobile frame means in which there are mounted both said winding core and said supply spool;

a coupling arrangement for the selective coupling of drive means to one of said winding core and said supply spool;

a blocking device effective in a winding-off rotational direction of the products from the winding core; and

said winding core being brakeable in the winding-off rotational direction.

4,587,791

EDGE PROTECTOR POSITIONING APPARATUS

S. Bernard Brouse, Orland Park, and John Wiedel, Chicago, both of Ill., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Dec. 24, 1984, Ser. No. 685,526

Int. Cl.⁴ B65B *13/06*

U.S. Cl. 53—128 **14 Claims**

1. Positioning apparatus for positioning an edge protector at an edge of a package to be looped with a strapping, said edge protector having a package contact face comprising:

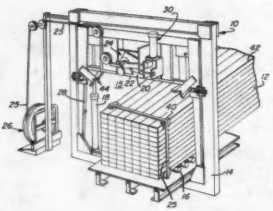
(a) a feeder having a delivery station for systematically receiving edge protectors to be dispensed;

(b) an application station immediately adjacent said delivery station for receiving individual edge protectors from said delivery station;

(c) an operator for selectively driving an edge protector from said delivery station to said application station, said operator including a pushing surface normal to the longitudinal axis of the edge protector and at least one for-

wardly extending finger having an edge protector support surface and means to reciprocate said operator between said delivery and application stations;

(d) clamping means at said application station for applying a substantially normal force to said edge protector for retaining said edge protector on said support surface and in



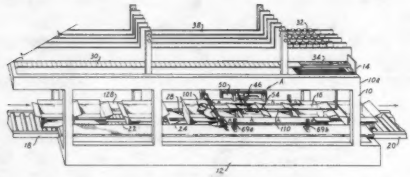
spaced conforming relation to said edge while said operator is disposed within said application station and upon retraction of said operator for tilting said edge protector onto said edge and retaining said edge protector in conforming relation to said edge when said operator is removed from said application station.

4,587,792

APPARATUS FOR OPENING BOX FLAPS ON AN ARTICLE LOADING MACHINE

Thomas S. Hartness, and E. Leon Hopkins, both of Greenville, S.C., assignors to Hartness International, Inc., Greenville, S.C.

Filed Aug. 6, 1984, Ser. No. 638,256
Int. Cl.[4] B65B *43/39*
U.S. Cl. 53—382 **26 Claims**



1. In an article packing machine of the type having a container conveyor on which boxes are conveyed to be loaded with articles, an article conveyor for conveying articles to an article loading station, a grid set at the article loading station which receives the articles and arranges the articles for loading and packing of the articles in said boxes, said boxes being of the type having front and rear end flaps and side flaps for closing the top of the box, apparatus for opening the flaps of the boxes to insure the box top is open for loading comprising:

a flap opening mechanism adapted for being carried on a frame of said machine;

a movable flap opening engagement means carried by said mechanism for movement in a prescribed motion to engage a closed end flap and move said end flap toward an open position;

programmed control means carried by said assembly and connected to said flap opening means for moving said flap opening means in said prescribed motion; and

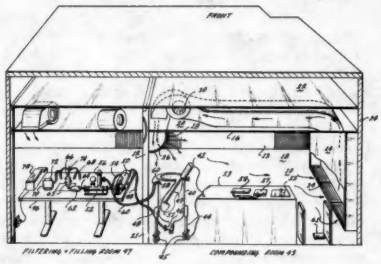
elongated elastic cord means carried above said box along said conveyor and which yields to the lifting of said closed end flap while forcing and retaining said flap open.

4,587,793

PHARMACEUTICAL INFUSION PRODUCTS AND THE PROCESS AND APPARATUS FOR THE MAKING THEREOF

Eric L. Brennan, and Kenneth W. Schawel, both of Mission Viejo, Calif., assignors to Home Health Care of America, Inc., Newport Beach, Calif.

Filed Jan. 16, 1985, Ser. No. 692,653
Int. Cl.[4] B65B *55/02*
U.S. Cl. 53—425 **28 Claims**



15. A process for preparing aseptic pharmaceutical liquids at ambient temperatures for medical usage comprising:

providing one or more enclosures substantially free of pathogenic organisms;

delivering air to each said enclosure which has been filtered to remove pathogenic organisms;

recirculating air within said enclosures and filtering it to remove pathogenic organisms for delivery back to said enclosures;

providing a mixing tank within one of said enclosures;

providing prescription amounts of dry and liquid ingredients sufficient to prepare liquid pharmaceutical products;

placing within said mixing tank prescription amounts of dry and liquid ingredients for the preparation of liquid pharmaceutical solution;

mixing said dry and liquid ingredients together to form a solution;

providing filtering and filling apparatus within one of said enclosures;

conducting said mixture from said mixing tank to said filtering and filling apparatus;

filtering said mixture through one or more high efficiency liquid filters which excludes pathogenic organisms; and,

implacing said mixture into at least one sterile container.

4,587,794

APPARATUS FOR FORMING A SINGLE-FIN WRAPPER SLEEVE

Georg Kopp, Uhwiesen, Switzerland, assignor to SIG Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

Filed Mar. 14, 1984, Ser. No. 589,439
Claims priority, application Switzerland, Mar. 14, 1983, 1392/83
Int. Cl.[4] B65B *9/22*
U.S. Cl. 53—550 **8 Claims**

1. An apparatus for forming a single-fin wrapper sleeve about articles advanced through the apparatus, comprising

(a) conveying means including a support on which the articles are placed and which defines a plane of conveyance and means for advancing the articles in a conveying direction in said plane of conveyance;

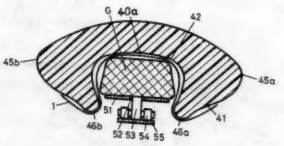
(b) guiding means for advancing a wrapper foil running through the apparatus;

(c) shaping means for gradually deforming the wrapper foil from a planar configuration to a closed, tubular shape being void of angular edges; said shaping means including

a shaping body having a vertical longitudinal halving plane extending parallel to said conveying direction and perpendicularly to said plane of conveyance; said shaping body including

(1) a first main forming surface having a planar surface portion situated above said plane of conveyance and inclining theretoward in said conveying direction;

(2) a second main forming surface joining said first main forming surface downstream as viewed in said conveying direction; said second main forming surface having a gradually closing tubular, outwardly concave shape



surrounding said support and means defining a longitudinal slot extending underneath said plane of conveyance parallel to said conveying direction and symmetrically with respect to said halving plane, whereby said wrapper foil, upon sliding on said second main forming surface is gradually deformed to said closed tubular shape; and

(d) sealing means situated downstream of said shaping body for longitudinally sealing together portions of the foil to form said single-fin wrapper sleeve therefrom; said sealing means forming part of said guiding means.

4,587,795

DISCHARGE DEVICE FOR BAG-MAKING, FILLING AND PACKING APPARATUS

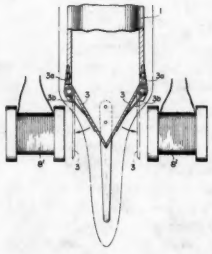
Kiyoshi Yamashita, Toride, Japan, assignor to Tokyo Automatic Machinery Works, Ltd., Tokyo, Japan

Filed Aug. 2, 1984, Ser. No. 636,988

Claims priority, application Japan, Feb. 21, 1984, 59-24062[U]

Int. Cl.⁴ B65B *9/08, 1/10*

U.S. Cl. 53—551 **11 Claims**



1. In an apparatus for forming, filling and closing a series of bags, said apparatus including a bag-making cylinder around which a film can be wrapped to form a cylinder as the film passes along the length of said bag-making cylinder in a downstream direction, and a sealing means located adjacent the downstream end of the cylinder to simultaneously close the open top of a downstream bag and close the bottom of an adjacent upstream bag, said bag-making cylinder enabling commodity articles to pass through the interior thereof and into a bag whose bottom has been closed but whose upstream end is still open, the improvement wherein means are provided for controlling the passage of commodity articles through the interior of said bag-making cylinder and into each successive bag, said means including two movable covers which, when moved together, close the interior of said bag-making cylinder and, when moved apart, open the interior of said bag-making cylinder, and two magnets, each of said two magnets being located adjacent an associated one of said two movable covers at a location outside the film passing over said bag-making cylinder, the magnetic fields of said magnets being capable of acting directly on said covers to move them apart.

4,587,796

PACKAGING MACHINE

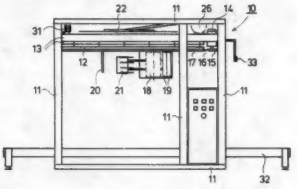
Matti Haloila, Mynämäki, Finland, assignor to Oy M. Haloila AB, Finland

Filed Apr. 19, 1984, Ser. No. 602,007

Claims priority, application Finland, Apr. 21, 1983, 831375

Int. Cl.⁴ B65B *13/04*

U.S. Cl. 53—588 **6 Claims**



1. Apparatus for packaging articles in film material, comprising:

a first frame structure adapted to receive an article to be wrapped in film material while the article is maintained stationary;

a second non-rotating support frame mounted in said first frame structure for reciprocating movement in up and down directions and means for selectively raising and lowering said second support frame;

a frame assembly rotatably mounted on said second non-rotating support frame so as to be raised and lowered therewith; and means mounted on said second non-rotating support frame for rotating said rotatable frame assembly;

a roll of film material mounted on said rotatable frame assembly; and

means mounted on said rotatable frame assemby for maintaning tension in the film material as the film material is payed out from said film material roll.

4,587,797

BRIDOON BIT

Ulrich Conrad, Hans-Am-Ende-Weg 23, 2862 Worpswede, Fed. Rep. of Germany

Filed Feb. 15, 1983, Ser. No. 466,570

Claims priority, application Fed. Rep. of Germany, Apr. 18, 1979, 2915573

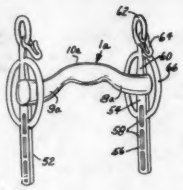
The portion of the term of this patent subsequent to Mar. 1, 2000, has been disclaimed.

Int. Cl.⁴ B68B *1/06*

U.S. Cl. 54—8 **2 Claims**

1. A bridoon bit comprising a bar including a center segment and two lateral end portions, each of the lateral end portions having an eyelet through each of which there extends a curb arm connecting with the bridoon, the improvement comprising a thickened center segment (11) with a curved lateral axis and having soft transitions (10, 12) to the end portions (8, 9) on either side of the center segment, said portions being curved in a direction reverse to the curvature of the center segment, the

cross-section (22) of the thickened center section being substantially elliptical, the longer longitudinal axes thereof (FIGS.



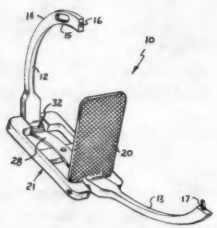
4, 32) being parallel to the axis of the eyelets (6, 7) on both sides.

4,587,798

SAFETY STIRRUP

Gregory A. Taylor, Lot 2 New England Highway, Blandford, New South Wales 2338, Australia

Filed Feb. 28, 1985, Ser. No. 706,486
Claims priority, application Australia, Mar. 1, 1984, PG3855
Int. Cl.[4] B68C *3/02*
U.S. Cl. 54—49 **7 Claims**



1. A safety stirrup comprising: a main body portion having two side arms which in use extend generally downwardly from a saddle strap in a spaced generally coextensive relationship with one of said arms at its upper end being adapted to be attached to said saddle strap; a base extending between the lower extremities of said arms and pivotally supported by same; and a foot engaging member fixed to the other arm, to said one arm, and extending therefrom so as to be located between said arms and above said base, and wherein said arms are releasably attached at their upper ends so that upon a lateral force being applied to said other arm, said arms disengage at their upper ends and said base and said other arm pivot to dislodge a rider's foot from within the stirrup by movement of said foot engaging member.

4,587,799

HARVESTER MACHINE FOR STRIPPING SEEDS FROM A STANDING CROP

Kenneth R. Thomas, Moline, Ill., and Neil L. West, Bettendorf, Iowa, assignors to Deere & Company, Moline, Ill.

Filed May 21, 1984, Ser. No. 612,520
Int. Cl.[4] A01D *45/30*
U.S. Cl. 56—14.6 **12 Claims**

1. A harvesting machine for stripping seeds from a standing crop while substantially leaving the crop stems attached to the soil and comprising:

a mobile main frame adapted to advance over a field of standing crop;

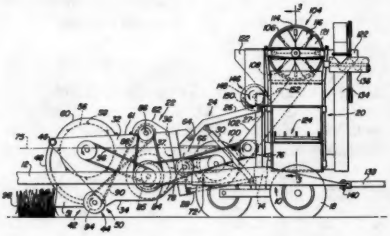
a forwardly disposed header having opposite lateral sides, a transverse floor extending between the opposite sides, a rear wall having a crop discharge opening, an axially transverse stripping rotor extending between the opposite sides at the forward end of the fllor and including a plurality of stripping elements, the rotor being rotated so that the stripping elements move upwardly on the front side of the rotor and engage the seed bearing heads of the crop to separate the seeds and chaff from the crop stems by impact and deliver said crop material rearwardly above the floor, and a crop converging conveyor means extending between the opposite sides above the floor and rearwardly of the stripping rotor and adapted to receive the crop material removed from the stems, move it laterally on the header and discharge it rearwardly through the discharge opening;

means mounting the header on the main frame for vertical adjustment relative thereto;

a feeder housing extending rearwardly from the header in crop receiving relationship with the discharge opening and having an outlet and conveyor means for moving the crop material from the header discharge opening through the feeder housing outlet;

an elevator means having a rearward outlet mounted on the frame and a forward inlet commuicating with the feeder housing outlet and adapted to move the crop material from the feeder housing outlet through the elevator outlet;

a first crop cleaning means mounted on the frame and including a grate means, an outlet, (and) an impeller adapted



to move crop material from the elevator outlet over the grate means so that the seeds fall through the grate means while a portion of the crop material lighter or longer than the seeds is discharged through the outlet and a blower means adapted to move air inwardly through the grate means to entrain lighter crop material and discharge it through the outlet;

a second cleaning means mounted on the frame below the first cleaning means and adapted to receive the crop material passing through the grate means and separate the seeds from other crop material, said second cleaning means including a clean grain collecting conveyor adapted to receive and convey the seeds separated by the second cleaning means and a tailings conveyor adapted to receive unthreshed seeds separated by the cleaning means and to convey them to an outlet;

a rethreshing means mounted on the frame and adapted to receive unthreshed seeds from the tailings conveyor, rethresh said material, and deliver the rethreshed material to one of the cleaning means; and

drive means for driving the stripper rotor, the header conveyor means, the feeder house conveyor means, the elevator means, the cleaning means impeller and the rethreshing means.

4,587,800

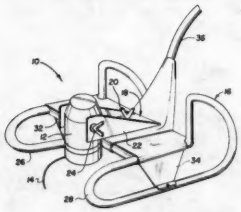
GRASS TRIMMING AND EDGING DEVICE

Raul Jimenez, 5308 Jerri La., Fort Worth, Tex. 76117

Continuation of Ser. No. 600,441, Apr. 16, 1984, abandoned. This application Feb. 19, 1985, Ser. No. 702,902

Int. Cl.[4] A01G *3/06;* **A01D** *53/00*

U.S. Cl. 56—16.9 **1 Claim**



1. A trimming device comprising in combination:

a motor;

a housing for the motor;

a cutting element connected to the motor so as to be rotatable about an axis for cutting grass, weeds and the like;

a carriage;

a vertical axis pivot means;

a support member rotatable with respect to the carriage in a substantially horizontal plane about the vertical axis pivot means; and

a horizontal axis pivot means affixed to the support member, spaced apart from the vertical axis pivot means wherein the motor housing is rotatable about the horizontal pivot means with respect to the support member;

wherein the motor can be supported in both a first position in which the axis of rotation of the cutting element is substantially vertical and a second position in which the axis of rotation for the cutting element is substantially horizontal.

4,587,801

SYSTEM FOR ROTATIONALLY SLAVING AN OPTICAL FIBER FEEDING AND DISPENSING DEVICE IN A CABLING LINE

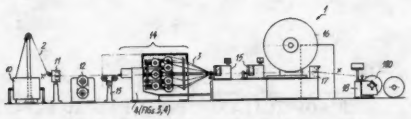
Bernard M. Missout; Jean-Pierre Michaux, and Jean-Luc Piova, all of Paris, France, assignors to Societe Anonyme de Telecommunications and Societe Industrielle de Liaisons Electriques, both of Paris, France

Filed May 29, 1985, Ser. No. 739,060

Claims priority, application France, May 30, 1984, 84 08532

Int. Cl.[4] G02B *6/04;* **H01B** *13/02*

U.S. Cl. 57—6 **16 Claims**



1. A system for slaving a rotational speed of optical fiber feeding means rotationally driven by first motor means to a number of helical groove pitches per second in a grooved ring drawn at a constant translational speed by second motor means along an optical fiber cabling line, said optical fibers fed from said feeding means being laid into said ring grooves through rotating fiber-dispensing means,

said system comprising means mechanically coupled partly to said ring and partly to said feeding means for continuously detecting a speed difference between said rotational speed and said number of pitches per second thereby converting said detected speed difference into a voltage variation,

said first motor means comprising first input means mechanically coupled to said second motor means, second input means electrically coupled to said detecting means, and output means mechanically coupled to said first and second input means for rotationally driving said fiber feeding means at a rotational speed proportional to a rotational speed imposed by said second motor means and continuously corrected by the said detecting speed difference, and

said fiber-dispensing means being rigidly linked to said fiber feeding means.

15. In an optical fiber cabling line where a ring having parallel helical grooves is drawn at a constant translational speed by a main motor, a system for slaving a rotational speed of optical fiber feeding and dispensing means rotationally driven by motor means to a number of translated ring groove pitches per second, said optical fibers fed from said feeding and dispensing means being dispensed into said grooves in said translated ring.

said system comprising translationally stationary means rotationally driven by said helical grooves of said translated ring, means rotationally linked to said fiber feeding and dispensing means and translatable parallel to said ring by said rotationally driven means in response to a speed difference between said rotational speed and said number of pitches per second, and electromechanical means for detecting a translation of said translatable means thereby converting said speed difference into a voltage variation,

and said motor means comprising a gearbox mechanically coupled to said main motor, a direct current and variable speed corrector motor controlled by said voltage variation, and a differential mechanically coupled to said gearbox and corrector motor for rotationally driving said fiber feeding and dispensing means at a rotational speed proportional to a rotational speed imposed by said gearbox and continuously corrected by said corrector motor in function of said speed difference.

4,587,802

PROCESS FOR PIECING CORE SPUN YARNS

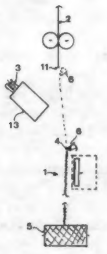
Jean-Louis Faure, Noley, France, assignor to ASA S.A., Villeurbanne, France

Filed Aug. 2, 1984, Ser. No. 637,013

Claims priority, application France, Sep. 20, 1983, 83 15114

Int. Cl.[4] D01H *15/00*

U.S. Cl. 57—261 **7 Claims**



1. A process for piecing, after breaking, a core spun yarn comprising an internal core surrounded by a fibrous sheath, on a machine having:

delivery means for delivering an elementary core yarn which will become the internal core of the core spun yarn;

distribution means for distributing discontinuous fibers onto the elementary core yarn so as to form the fibrous sheath, thereby producing said core spun yarn; and

receiving means for receiving the core spun yarn so produced;

the process comprising:

taking a broken end of the core spun yarn off of the receiving member;

removing the fibrous sheath from said core spun yarn to expose the internal core of said core spun yarn over a pre-determined length at said broken end thereof;

connecting said broken end of the thus exposed internal core with an end of the elementary core yarn;

introducing the connected exposed core and elementary core yarn into the distribution means;

distributing fibers on the exposed core and elementary core beginning at the point of said bared core opposite said broken end and continuing along said elementary core, thereby again continuing production of core spun yarn; and

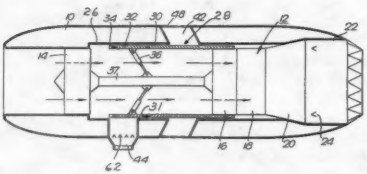
resuming normal advance and winding of said receiving member.

4,587,803

VALVE FOR DIVERTING FLUID FLOWS IN TURBOMACHINES

Douglas J. Nightingale, Jonesboro, and Benjamin D. Ward, Marietta, both of Ga., assignors to Rolls-Royce Inc., New York, N.Y.

Filed Aug. 15, 1983, Ser. No. 523,056
Int. Cl.[4] F02K *3/02*
U.S. Cl. 60—226.1 **5 Claims**



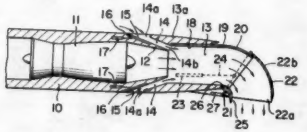
1. A fluid flow diverter valve for a gas turbine engine of the type that comprises a fluid flow duct, first and second axial flow compressors spaced along the duct, a combustible means downstream of the compressors, turbine means downstream of the combustion means connected to the compressors to drive the compressors, one or more air outlet openings in the duct wall of a region between the first and second compressors, and an auxilliary air intake in the duct wall spaced along the duct from the one or more outlet openings and located at a region between the one or more outlet openings and the second compressor, the valve comprising: a hollow tubular sleeve extending co-axially along the duct, the sleeve being movable in directions along the duct, and being provided with one or more openings which in a first position of the sleeve uncover the auxilliary air intake in the duct wall; a plurality of doors each of which is pivotally mounted at one of its ends on the sleeve, the doors being spaced around the axis of the duct and being shaped and positioned so that in a first position of the doors they lie along the length of the duct and at least one of the doors obturates the one or more openings in the sleeve and in a second position of the doors the free end of each door is moved radially inwards and each door co-operates with the other doors and thereby obturate the duct; a plurality of links each of which is pivotally mounted at one end to a member which is fixed and is pivotally connected at its other end to one of the doors; an actuator for translating the sleeve from the first position of the sleeve where the sleeve and the doors obturate the one or more openings in the duct wall and the auxilliary air intake and provides a flow path from the first compressor to the second compressor, to a second position of the sleeve where the links pull open the doors and move them to a position where they obturate the flow path from the first compressor to the second compressor and the sleeve uncovers the one or more outlet openings in the duct wall and uncovers the auxilliary air intake.

4,587,804

DEVICE FOR INCREASING AND DEFLECTING THRUST OF JET-PROPULSION ENGINE OF V/STOL AIRCRAFT

Shigeru Horinouchi, Mibu, and Atsushi Tanaka, Utsunomiya, both of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 27, 1984, Ser. No. 574,495
Claims priority, application Japan, Jan. 31, 1983, 58-14441
Int. Cl.[4] F02K *1/00, 1/38*
U.S. Cl. 60—230 **5 Claims**



1. In a vertical/short takeoff and landing (V/STOL) aircraft in which exhaust gas from a jet-propulsion engine defining an engine axis is discharged through an exhaust gas passage, a thrust increasing and deflecting device comprising

means defining secondary air induction passages for communicatively connecting outside atmosphere to an upstream end of said exhaust gas passage to induct outside air as secondary air, by ejector action of said exhaust gas, into said exhaust gas passage so as to mix with said exhaust gas,

inlet flap gates respectively at inlet ends of said secondary air induction passages and being operable to selectively close and open said air induction passages,

deflector means at an outlet part of said exhaust gas passage for being operable to selectively vary final direction of discharge of the exhaust gas between an undeflected direction substantially parallel to the engine axis for forward flight and respectively a deflected flow path defining a deflected direction substantially perpendicularly downward relative to said engine axis for V/STOL takeoff or landing, said deflector means including a guide vane device moveably mounted so as to be disposed in a central zone of the deflected flow path defined within said deflector means for preventing separation of flow at an inner side of the deflected flow path in a condition for said deflected direction and respectively so as to be at an outside boundary of said outlet part of said exhaust gas passage when said deflector means is in a condition for said undeflected direction,

said guide vane device comprises

guide vanes, and

intermeshing gears defining rotational axes respectively synchronously coupled to said guide vanes.

4,587,805

ELECTRO-OPTICAL CONTROL OF SOLID FUEL ROCKET BURN RATE

Peter C. Winch, Elizabeth East, Australia, and Mick Blackledge, Lancaster, Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

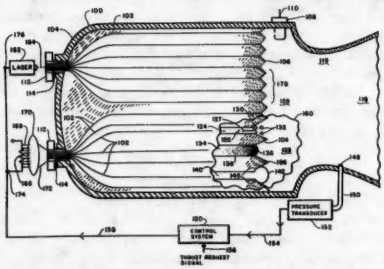
Filed Jan. 29, 1985, Ser. No. 696,298
Int. Cl.[4] F02K *9/26*
U.S. Cl. 60—234 **16 Claims**

1. Apparatus for adjusting the burn rate of a solid fuel rocket motor comprising the combination of:

means for transducing an electrical burn rate control signal into an optical control signal;

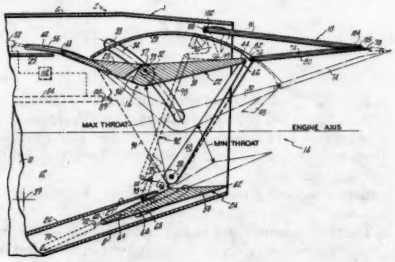
means for conducting said optical control signal through the

unburned mass of said solid fuel to the fuel burn face of said rocket motor; and



means located adjacent said burn face for converting said optical control signal to fuel preheating burn rate controlling heat energy.

4,587,806
AREA TWO-DIMENSIONAL CONVERGING/DIVERGING NOZZLE
William M. Madden, Palm Springs, Fla., assignor to United Technologies Corporation, Hartford, Conn.
Filed May 11, 1981, Ser. No. 262,368
Int. Cl.[4] F02K *1/12*
U.S. Cl. 60—271 **5 Claims**



1. A two-dimensional variable area exhaust nozzle assembly for a gas turbine engine, said engine having an axis and comprising:

exhaust duct means having opposed, fixed, side walls;

variable position exhaust nozzle means disposed within said exhaust duct means, said nozzle means including upper flap means and lower flap means opposed to said upper flap means, said upper and lower flap means and said side walls together defining a converging/diverging exhaust nozzle gas flow path, said nozzle means having a forward end and rearward end, said forward end being upstream of said rearward end;

said upper flap means comprising a movable upstream flap having a forward edge and rearward edge and a movable downstream flap having a forward edge and rearward edge, said forward edge of said downstream flap being hinged along a first axis to said rearward edge of said upstream flap for rotation of said downstream flap about said first axis;

first actuation means associated with said upper flap means for moving and guiding said upper flap means to vary the throat area of said nozzle means, said actuation means comprising guide means for guiding the movement of said upper flap means between

(A) a maximum throat area first position wherein

(i) said upstream flap forms a converging angle with respect to the engine axis, and

(ii) said downstream flap forms a diverging angle with respect to the engine axis; and

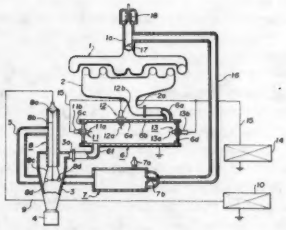
(B) a minimum throat area second position wherein

(i) said forward edge of said upstream flap is downstream of its first position and said upstream flap forms a converging angle with respect to the engine axis; and

(ii) said forward and rearward edges of said downstream flap are both downstream of their first positions and closer to the engine axis; and

second actuation means connected to said lower flap means for moving said lower flap means between first and second positions to vary the throat area of said nozzle means, wherein said guide means for guiding the movement of said upper flat means includes means constraining said rearward edge of said downstream flap to move in a ciroular arc about another fixed axis, said other axis being parallel to said downstream flap rearward edge and located upstream of said downstream flap rearward edge.

4,587,807
APPARATUS FOR TOTALLY RECYCLING ENGINE EXHAUST GAS
Nagatoshi Suzuki, 5-5-7, Kugahara, Ota-ku, Tokyo, Japan
Filed Apr. 18, 1983, Ser. No. 486,188
Int. Cl.[4] F02M *25/06;* F01N *3/02*
U.S. Cl. 60—274 **14 Claims**



9. A method of burning fuel in the combustion chamber of an engine using an apparatus of the type which comprises an electrostatic precipitator connected to the exhaust manifold of the engine; a dissociation chamber connected to said electrostatic precipitator and to the intake manifold of the engine and including a dissociated gas control reservoir connected to said dissociation chamber and to the engine intake manifold; and a cyclone drum connected to said electrostatic precipitator for removing particles from the exhaust gases in said electrostatic precipitator, said method comprising the steps of:

dissociating the molecules of the exhaust gas from the engine in said dissociation chamber into monomolecules by subjecting said exhaust gas to the effects of a corona discharge in said dissociation chamber;

removing carbon and other particulate matter from the exhaust in said electrostatic precipitator and cyclone drum to dedust the exhaust gas; and

igniting a mixture of fuel and the dedusted exhaust gas in the combustion chamber of the engine, whereby fuel is initially oxidized solely by an oxygen component of the dissociated exhaust gas.

4,587,808

CONTROL SYSTEM FOR HYDRAULIC CIRCUIT MEANS

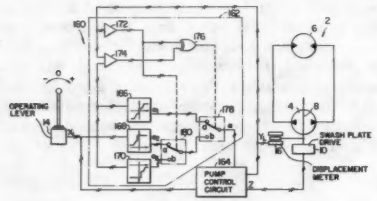
Hiroshi Watanabe; Eiki Izumi; Yukio Aoyagi, all of Chiyodamura; Kazuo Honma, Amimachi, and Kichio Nakajima, Chiyodamura, all of Japan, assignors to Hitachi Construction Machinery Co., Ltd., Tokyo, Japan

Filed Mar. 30, 1982, Ser. No. 363,454

Claims priority, application Japan, Mar. 30, 1981, 56-45386; Mar. 26, 1982, 57-48336

Int. Cl.⁴ F16D *31/02*

U.S. Cl. 60—389 9 Claims



1. A control system for hydraulic circuit means including a variable displacement hydraulic pump and an actuator driven by said pump, the operating speed of said actuator being controlled by the position of a displacement volume varying member of said pump, the control system comprising operating means for generating an operating signal for giving a command with regard to the position of said displacement volume varying member of said pump and thus the operating speed of the actuator, detector means for detecting an actual position of the displacement volume varying member and generating a signal indicative of the actual position, and pump control means for controlling said displacement volume varying member based on said operating signal and said detector signal while restricting the operating speed of the displacement volume varying member to a level below a predetermined maximum speed, wherein said control system comprises:

maximum speed setting means selectively setting one of a first predetermined maximum speed and a second predetermined maximum speed higher than said first predetermined maximum speed as said predetermined maximum speed for the operating speed of the displacement volume varying member, said first predetermined maximum speed being of the value for allowing the actuator to perform smooth operation upon normal operation thereof and said second predetermined maximum speed being of the value for allowing the actuator to perform swift operation upon emergency halting thereof, rapid reversing of the operation direction thereof, or accurate positioning thereof, said maximum speed setting means including switch means having a first position to select said first predetermined maximum speed and a second position to select said second predetermined maximum speed and connected to said pump control means for providing the selected one of said first and second predetermined maximum speeds as an output to said pump control means, and switch actuating means associated with said operating means and detector means for actuating said switch means so as to take one of said first and second positions, said switch actuating means being operative to actuate said switch means so as to take said first position and thus select the first predetermined maximum speed when said operating means is operated such that the direction of operation of the actuator commanded by the operating signal is the same as the actual direction of operation thereof represented by said detector means signal indicative of the actual position of the displacement volume varying member and to actuate said switch means so as to take said second position and thus select the second position and thus select the second predetermined maximum speed when said operating means is operated such that the operating signal commands returning of the displacement volume varying member into a neutral position or the direction of operation of the actuator commanded by the operating signal is opposite to the actual direction of operation thereof represented by said detector means signal indicative of the actual position of the displacement volume varying member, whereby the pump control means effects speed control of the displacement volume varying member based on the first and second predetermined maximum speed selected by the maximum speed setting means.

4,587,809

PREMIXING SWIRLING BURNER

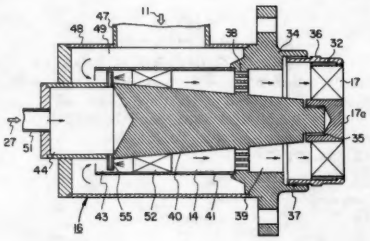
Takashi Ohmori; Isao Sato; Yoji Ishibashi; Yoshimitsu Minakawa; Michio Kuroda, and Zensuke Tamura, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 386,278, Jun. 8, 1982, abandoned. This application Dec. 3, 1984, Ser. No. 677,244

Claims priority, application Japan, Jun. 15, 1981, 56-90863

Int. Cl.⁴ F02C *1/00*; F02G *3/00*

U.S. Cl. 60—737 8 Claims



1. A premixing swirling burner comprising:

a burner body including a swirling member located at a downstream end thereof for causing fuel introduced into the burner body to flow in vortical form through said swirling member;

a burner outer frame means for mounting said burner body therein;

a cylindrical member located in said burner outer frame means for enclosing an outer periphery of a central body portion of said burner body;

an air passage formed between an inner periphery of said outer frame means and an outer periphery of said cylindrical member;

air inlet means disposed on said outer frame means and communicating with said air passage for enabling an introduction of air into the burner body;

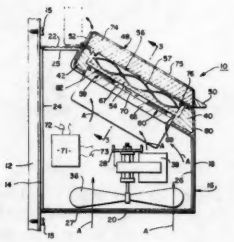
a premixing chamber defined upstream of said swirling member between the outer periphery of the central body portion of said burner body and an inner periphery of said cylindrical member for mixing air introduced through said air inlet means to provide a fuel-air premix flowing toward said swirling member; and

channel means disposed on the inner peripheral side of an upstream end portion of said cylindrical member for forming an inlet for the premixing chamber, said channel means being in communication with said air passage, and wherein a fuel chamber means is provided for introducing the fuel into the interior of said burner body, and fuel ejection means are located on the outer peripheral surface of the central body portion of said burner body in the vicinity of said channel means for injecting fuel into an air current flowing through said channel means into the premixing chamber whereby fuel and air are introduced into the premixing chamber, said channel means has a cross-sectional area smaller than a cross-sectional area of said air passage.

4,587,810
THERMOELECTRIC ICE MAKER WITH PLASTIC BAG MOLD

Charles J. Fletcher, Sparta, N.J., assignor to Clawson Machine Company, Inc., Franklin, N.J.

Filed Jul. 26, 1984, Ser. No. 634,833
Int. Cl.[4] F25B *21/02;* F25C *1/04*
U.S. Cl. 62—3 27 Claims



1. An ice making apparatus comprising:

mold means for holding a plurality of bodies of liquid water each in the shape of an ice cube, said mold means comprising a bag of thin-film plastic material having opposing walls adhered together along areas of adhesion so as to form a plurality of [illegible]ments each interconnected to at least one other compartment by a water passageway, said bag having an inlet means for introducing water into at least one of said interconnected compartments and closure means for closing said inlet means so as to seal water within said compartments;

a cooling member of heat conductive material for supporting said bag and conducting heat away from water within said bag compartments;

thermoelectric means for cooling said cooling member so as to freeze at least a portion of said bodies of liquid water and form ice in said bag compartments, said thermoelectric means including thermoelectric modules in thermal communication with a heat exchange assembly for transferring heat from said thermoelectric modules to a heat exchange medium, and fan means for moving said heat exchange medium past heat exchange surfaces of said heat exchange assembly;

an insulated housing extending around at least a portion of said cooling member and cooperating with said member to define a freezing chamber for said bag, said housing including means for causing natural convection flow of said heat exchange medium past the heat exchange surfaces of said heat exchange assembly, the capacities of said thermoelectric modules and said heat exchange assembly in the presence of said natural convection flow being sufficient to maintain previously frozen ice in the compartments of said ice bag in a frozen condition without continuous operation of said fan means; and,

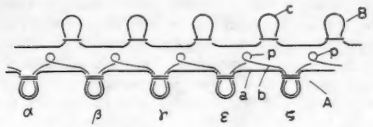
support means for supporting said cooling member and said insulated housing on a support member.

4,587,811
KNITTED FABRIC, METHOD OF KNITTING SAME AND MACHINE FOR THE SAME

Takenori Hiromoto; Yoshito Hiromoto, and Takuji Hiromoto, all of 747-1, Yoshihara, Wakayama, Japan

Filed Sep. 20, 1985, Ser. No. 778,527
Int. Cl.[4] D04B *7/04*
U.S. Cl. 66—196 2 Claims

1. A tubular plain stitched fabric having a face side structure thereof stitched to a back side one characterized in that one or both of said face side and back side structures is knitted into a

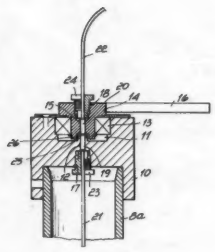


pile stitch, and said piles are adapted to lie between said two structures.

4,587,812
ELECTRONICALLY CONTROLLED CIRCULAR KNITTING MACHINE

Angelo Brega, Varese, Italy, assignor to Mec-Mor S.p.A., Induno Olona, Italy

Filed Jun. 4, 1984, Ser. No. 616,878
Claims priority, application Italy, Jun. 15, 1983, 21643 A/83
Int. Cl.[4] D04B *15/00*
U.S. Cl. 66—232 1 Claim



1. A circular knitting machine, in particular a cylinder and dial knitting machine having at least one machine stationary portion and a machine rotating portion defining an axis of rotation, said machine comprising a device for transferring control signals between said machine portions, said device comprising electric signal emitting means associated with one of said portions and electric signal receiving means associated with another of said portions, wherein between said emitting means and said receiving means optical fiber transmitting means and related electro-optical and opto-electric transducers are provided, said optical fiber transmitting means including a first optical fiber element attached to said one machine portion and a second optical fiber element attached to said another machine portion, said elements having mutually facing ends laid coaxial with said rotation axis of said rotating portion, thereby light flux can be transferred from one element to the other, wherein said second optical fiber element is attached to said rotating portion and has an end supported on said stationary portion through at least one bearing, wherein said first optical fiber element is attached to said stationary portion, said stationary portion including a fixed shaft having at least one hollow end coaxially attached to a cover having an axial bore therethrough for accommodating the end of said first optical fiber element, said cover also having at a top portion thereof a substantially cylindrical cavity for rotatably receiving a locating body connected to an end of said second optical fiber element, said locating body being rotatively driven by said rotating portion of the machine and wherein said cover has a substantially cylindrical axial lug penetrating said substantially cylindrical cavity, and said locating body has an axial annular ridge encircling said lug with some play, the machine further comprising, associated with said one machine portion, a microprocessor main control unit, a signal encoder in cascade to said

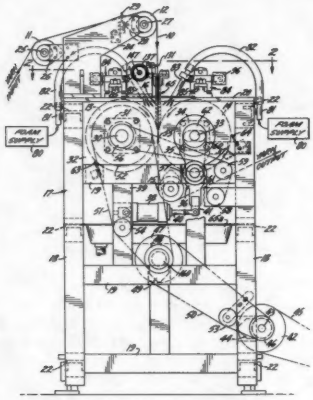
main control unit, an adapter, and an opto-emitter element associated with said first optical fiber element, and, associated with said another machine portion, an opto-receiver element associated with said second optical fiber element, an adapter, a decoder in cascade to said adapter, and an interlocked control unit for sequentially controlling actuators made rigid with said another portion of the machine and wherein said main control unit, said signal encoder, said successive adapter, and said opto-emitter element are associated with a stationary portion of the machine and wherein said optical fiber elements are associated together at a top end portion of said fixed shaft in a circular knitting machine having a fixed cylinder and rotating cam holding structure.

4,587,813

APPARATUS FOR APPLYING TREATMENT MATERIAL TO A TEXTILE MATERIAL

George R. Dilling, Rockford, Ill., assignor to Reed-Chatwood, Inc., Rockford, Ill.

Filed Sep. 12, 1984, Ser. No. 649,665
Int. Cl.[4] D06B *3/18*
U.S. Cl. 68—22 B **10 Claims**



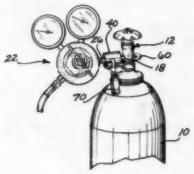
1. In an apparatus for applying a treatment material to a length of textile material, the combination of, a frame, first and second elongated rollers disposed side by side to turn about parallel horizontal axes with the peripheries of the rollers engaging each other, means defining an elongated pocket above said rollers and extending along the line of contact between said rollers, means for directing said textile material vertically down through said pocket and between said rollers at said line of contact, mechanism for advancing said textile material through said rollers, means for supplying said treatment material to said pocket whereby the treatment material is applied to the textile material before the latter enters between said rollers, said means for guiding the textile material including an elongated guide extending horizontally along and above said line of contact and down toward the bottom of said pocket and into said treatment material, said guide having a vertical passage therethrough for said textile material whereby the latter is exposed to treatment material only below the guide, means supporting said guide for vertical adjustment whereby the space between the lower end of said passage and the bottom of said pocket may be varied for different speeds of travel of the textile material, and means responsive to the speed of travel of said textile material and operable to position said guide vertically in accordance with such speed of travel.

4,587,814

MECHANICAL SECURITY DEVICE

Dennis W. Wilson, Sumner, Wash., assignor to Designs Unlimited, Inc., Federal Way, Wash.

Filed Jun. 8, 1984, Ser. No. 618,721
Int. Cl.[4] F16B *41/00*
U.S. Cl. 70—232 **5 Claims**



1. A security device for preventing the disconnection of first and second objects from one another, the first and second objects comprising connecting means including a connecting member rotatable with respect to the first and second objects in one direction about an axis to connect the objects and in an opposite direction about the axis to disconnect the objects, the security device comprising:

guard means adapted to be positioned around the connecting member so as to prevent the connecting member from being accessed for rotation thereof, the guard means comprising an integral, one-piece guard member shaped to fully encircle the connecting member; and,

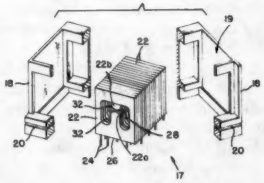
locking means adapted for preventing substantial rotational movement of the guard means with respect to the first object and for limiting axial movement of the guard means to a degree sufficient to prevent the connecting member from being accessed for rotation thereof.

4,587,815

NONROTATING, FLEXIBLE KEY LOCK

Eugenio S. Gil, Av. Francisco Solano López, Edf. Morichal, 40 Piso, Apto. 42, Sabana Grande - Caracas 1050, Venezuela

Filed Mar. 30, 1984, Ser. No. 595,223
Claims priority, application Spain, Dec. 12, 1983, 276.246
Int. Cl.[4] E05B *25/00*
U.S. Cl. 70—352 **19 Claims**



1. A lock for use with a nonrotating, flexible sheet key having a body with a plurality of holes therethrough positioned in accordance with a predetermined pattern, comprising:

a case with a slot for insertion of the key therethrough to place the key body in a stationary position within said case;

a plurality of juxtapositioned plates disposed within said case in independently slidable, fact-to-face relative relation to each other for movement along a path generally transverse to the key, each of said plates having a pin fixedly positioned at a selected location along an edge of said plate toward the key and extending therefrom toward the key for engagement therewith, said pins being aligned according to the predetermined hole pattern to have selective ones of said pins enter into the holes and other ones of

said pins contact the body upon movement of said plates along said path toward the key for placing each of said plates in a consent position, each of said plates having an aperture sized and positioned for coincidence with said aperture of each other of said plates when moved into their respective consent positions to form an elongated lateral opening, at least one of said plates having a body portion extending transverse to said lateral opening and being positionable to block and limit the length of said lateral opening if said at least one plate is not in said consent position as a result of insertion of a key without the predetermined hole pattern, said plates being positionable away from the key to maintain said pins disengaged from the key for unrestricted insertion of the key into said slot and being movable toward the key for engagement therewith after the key is inserted into said slot; and

a lug extending generally transversely through said plate apertures and being laterally movable within said lateral opening formed when said plates are in said consent position to indicate an unlocked condition, lateral movement of said lug being inhibited by said transverse body portion of said at least one plate when not in said consent position to indicate a locked condition.

4,587,816

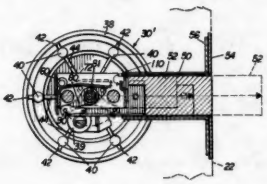
LOCK ASSEMBLY

Fidel Garcia, 7770 NW. 22 Ave., Miami, Fla. 33147

Filed Sep. 2, 1983, Ser. No. 529,144

Int. Cl.[4] E05B *63/00*

U.S. Cl. 70—417 **6 Claims**



1. A lock assembly of the type including a double cylinder construction mounted on a closure such as a door, said lock assembly comprising:

(a) a first and a second lock cylinder constructed to rotate and be key operated,

(b) casing means including two casing structures each including a continuous cylindrical configuration disposed in surrounding, substantially covering and protecting relation to separate ones of said lock cylinders,

(c) a cylinder cover formed on an interior of each of said two casing structures and each comprising an elongated, open-ended sleeve disposed in surrounding and at least partially covering relation to respective ones of said lock cylinders,

(d) reinforcing means integrally formed on each of said two casing structures for protection of said lock cylinders and comprising a first plurality of ribs formed on the interior of one of said casing structures in a substantially circular array and collectively surrounding a respective one of said cylinder covers,

(e) each of said first plurality of ribs having an elongated substantially planar configuration with one peripheral edge thereof secured to and extending along the entire length of said respective cylinder cover and an opposite peripheral edge secured to and extending along the length of an interior surface of said respective casing structure,

(f) said first plurality of ribs collectively disposed to extend radially outward from said respective cylinder cover to an inner periphery of said casing structure, whereby said reinforcing means is disposed in protecting and substantially surrounding relation to said respective cylinder cover,

(g) each of said plurality of ribs having a finger portion integrally formed therein along its length and intermediate the ends thereof, each of said finger portions including a solid, one piece construction having a transverse dimension greater than the transverse dimension of said respective rib,

(h) a bolt element interconnected to said lock cylinder and movable between a retracted and extended position upon rotation of at least one of said lock cylinders,

(i) activating means interconnected between said first and said second lock cylinders and said bolt element and including a throw link connected to rotate with each of said lock cylinders, and

(j) said throw link being interconnected to said bolt element and said activating means further structured to translate rotational movement of said lock cylinders and said throw link into linear movement of said bolt element.

4,587,817

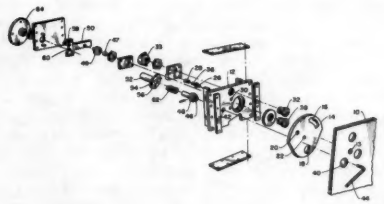
HIGH SECURITY INTERNAL LOCKING SYSTEM

Henry L. Self, Oxnard, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 29, 1984, Ser. No. 614,493

Int. Cl.[4] E05B *17/14*

U.S. Cl. 70—427 **7 Claims**



1. In a high security internal locking system, the combination comprising:

a. first and second locking mechanisms, adapted to be mounted on the inside of a door to be locked;

b. driving cog lock bolt means controlled by said second locking mechanism for locking said door;

c. a drill resistive rotatable shutter plate positioned in relation to said first and second locking mechanisms to protect them from tampering from outside the door;

d. said shutter plate and said door each having aperatures that can be aligned;

e. means for rotating said shutter plate to a first position to permit key access to said first locking mechanism;

f. means responsive to unlocking said first locking mechanism to permit rotation of said shutter plate to permit key access to said second locking mechanism; and

g. means responsive to unlocking said second locking mechanism to permit the engagement of said driving cog lock bolt means.

4,587,818

KEY RING HOLDER

Groves L. Griffin, 1370 McIntosh Rd., Douglasville, Ga. 30134

Filed Mar. 7, 1983, Ser. No. 472,950

Int. Cl.[4] A45F *5/02*

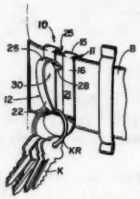
U.S. Cl. 70—457 **3 Claims**

1. A holder for mounting a key ring on a relatively thin support member such as a belt comprising:

a generally U-shaped base clip member including a curved central section and a pair of resilient legs integral with opposite ends of said central section and projecting away from said central section in an overlapping relationship so

that the projecting ends of said legs are resiliently urged toward each other to removably grip the thin support member therebetween; and

a ring clip member integral with one of said legs, said ring clip member including a first section attached to said one leg intermediate its ends and extending away from said one leg opposite said other leg and toward said central section; and a second curved section integral with the projecting end of said first section, said second section curving back toward said leg and including a tip portion directed back toward the projecting end of said one leg, said tip portion resiliently urged toward said one leg to define a ring receiving recess between said ring clip member and said one leg so that the key ring can be inserted into said ring receiving space by forcing the key ring between said tip portion and said one leg, but can only be removed from said ring receiving space by manually forcing said tip portion away from said one leg to permit the ring to pass therebetween, said ring clip member having been cut from said base clip member to form a slot extending along said one leg through said central section and into the other of said legs so that said slot is in registration with said tip portion on said ring clip member and said tip portion can move past said one leg to insure that the key ring will not inadvertently pass out of said ring receiving space without manually forcing said tip portion away from said one leg.



4,587,819

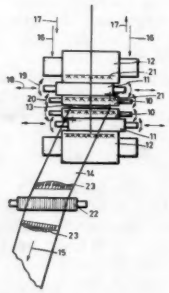
METHOD AND CIRCUIT FOR FLATNESS CONTROL IN ROLLING MILLS

Marek Hausen, Mannheim, Fed. Rep. of Germany, assignor to Brown, Boveri & Cie Aktiengesellschaft, Mannheim, Fed. Rep. of Germany

Filed Aug. 31, 1984, Ser. No. 646,906

Int. Cl.[4] B21B *37/06, 37/08*

U.S. Cl. 72—9 **19 Claims**



1. Method for controlling flatness in cold-rolling mills having a roll stand with a least six rolls including intermediate and working rolls capable of being deflected, which comprises measuring tensile stress distribution over the width of a strip to be rolled having central and edge regions, comparing the measured tensile stress distribution with a desired predeterminable tensile stress distribution, determining a deviation at the central region of the strip between the measured and desired tensile stress distribution, determining a deviation at the edge region of the strip between the measured and desired tensile stress distribution, forming a strip center coefficient from the central region deviation in the form of a deviation control for influencing deflection of the intermediate roll, and forming a strip edge coefficient from the edge region deviation in the form of a deviation control for influencing deflection of the working roll.

8. Circuit for controlling flatness in cold-rolling mills having a roll stand with at least six rolls including intermediate and working rolls capable of being deflected, comprising means for measuring tensile stress distribution over the width of a strip to be rolled having central and edge regions, means connected to said measuring means for comparing the measured tensile stress distribution with a desired predetermined tensile stress distribution forming a tensile stress distribution difference signal, a measured-value processing device having a measured-value input connected to said comparing means for forming a strip center coefficient and a strip edge coefficient from said tensile stress distribution difference signal, first and second control lines connected to said measured-value processing device, at least one first control element connected to said first control line for controlling deflection of the intermediate roll, and at least one second control element connected to said second control line for controlling deflection of the working roll.

4,587,820

ROLL HEAD FOR A PLANETARY CROSSROLLING MILL

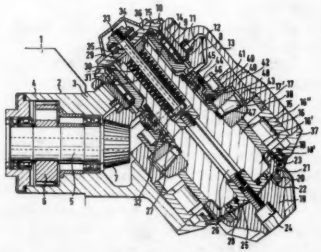
Friedhelm Bohmer, Grevenbroich, Fed. Rep. of Germany, assignor to SMS Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Jul. 29, 1983, Ser. No. 518,813

Claims priority, application Fed. Rep. of Germany, Aug. 5, 1982, 3229211

Int. Cl.[4] B21B *31/18*

U.S. Cl. 72—78 **19 Claims**



1. A roll head for a planetary cross-rolling mill comprising:

a roll head housing;

a roll shaft journalled in said housing and disposed, in operation, obliquely to the axis of the material to be rolled;

a radial bearing and an axial bearing having a thrust collar mounted in said housing and supporting said shaft adjacent to a first end of the shaft;

a tapered roll mounted in cantilever manner on said first end of said shaft;

a driving bevel wheel rotatably mounted in said housing, said bevel wheel receiving said shaft at a second end thereof remote from said first end in a manner such that said shaft is movable axially relative to said housing and is constrained to rotate with said bevel wheel;

a driving transmission for coupling said bevel wheel to head driving means of said mill;

a support ring in said housing, directly supporting said axial bearing on that side thereof that is opposite said first end of said shaft;

a stationary screw thread in said housing, said support ring having a screw thread in mesh with said stationary screw thread whereby rotation of said support ring effects axial adjustment of said support ring and thereby of said roll shaft and roll; and

clutch means for selectively coupling said support ring to said bevel wheel, for rotation thereby for effecting said adjustment of the support ring, or to the thrust collar of said axial bearing for locking said support ring in position during rolling;

said radial bearing being disposed in a position between said axial bearing and said first end of said roll shaft and having an internal bearing ring supporting the roll shaft, at least said internal bearing ring of said radial bearing being axially slidably movable in said roll head housing whereby said radial bearing accommodates the axial adjusting movement of said roll by axial change of position between at least said internal bearing ring of the radial bearing and said roll head housing.

4,587,821

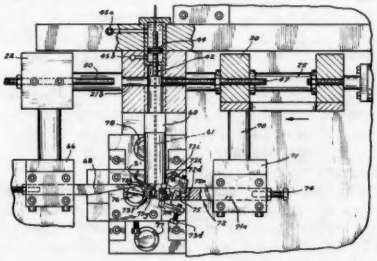
WIRE FORMING MACHINE

Willard D. Sykes, 5613—152nd St. North, Hugo, Minn. 55038

Filed Jan. 22, 1985, Ser. No. 693,378

Int. Cl.[4] B21F *3/02*

U.S. Cl. 72—137 **4 Claims**



1. A wire forming machine including wire feeding means, wire forming means, means operating said wire feeding means, means operating said wire forming means and a console controlling the operation of said wire feeding and wire forming means, in which improvement in connection with said wire forming means consists of

a quill

a supporting framework having said quill mounted thereon, means feeding wire through said quill,

a first carriage, means mounting said first carriage upon said framework and moving said carriage toward and away from said quill,

a wire engaging tool carried by said carriage,

a second carriage, means mounting said second carriage upon said framework and moving said second carriage toward and away from said quill,

a wire engaging tool carried by said second carriage,

a third carriage, means mounting said third carriage upon said framework and moving said third carriage toward and away from said quill,

a wire engaging tool carried by said third carriage,

a stop member carried by said first carriage,

stop means engaged by said stop member limiting the movement of said first carriage,

said stop means comprises

a block member carried by said framework

a bore through said block member parallel to the passage through said quill,

a cylinder disposed in said bore,

a second bore through said block intersecting said first mentioned bore and being in alignment with said stop member of said first carriage and receiving the same therein, and

means causing said cylinder to move through said bore to intersect said second bore,

whereby said cylinder forms a stop in said second bore for said stop member of said first carriage.

4,587,822

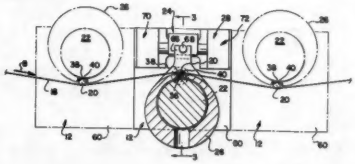
TENSION LEVELING APPARATUS

Charles R. Bradlee, Sidney, Ohio, assignor to The Monarch Machine Tool Company, New Bremen, Ohio

Filed Aug. 10, 1984, Ser. No. 639,542

Int. Cl.[4] B21D *1/05, 31/00*

U.S. Cl. 72—163 **13 Claims**



13. A tension leveling apparatus for leveling strips of metallic material, comprising:

a support housing;

a cylindrical support roll having a pair of stubs extending from ends thereof, said stubs rotatably attached to said support housing such that said support roll rotates about a central, rotational axis of said support roll;

a guide tube having a substantially cylindrically-shaped body including a cylindrically-shaped inner wall forming a hollow interior sized to receive said support roll therein, said body having opposing guide surfaces forming a longitudinal slot therethrough, and a pair of end plates attached at ends of said body and rotatably attached to said support roll, said end plates including upwardly extending yoke means;

a cylindrical work roll having a diameter substantially less than said support roll and positioned within said slot such that one portion thereof contacts said work roll and a different portion thereof protrudes outwardly from said guide tube sufficiently to engage a metallic strip passing thereover; and

means connected to said yoke means and responsive to pressure exerted by said work roll against said guide tube for rotating said guide tube to position said work roll such that a force exerted upon said work roll by a metallic strip passing thereover acts to hold said work roll against said support roll, and components of said force tangential to said work roll tending to urge said work roll against said guide surfaces are in equilibrium.

4,587,823

APPARATUS AND METHOD FOR PRESS-EDGING HOT SLABS

Werner W. Eibe, McCandless Township, Allegheny County, Pa., assignor to Blaw-Knox Corporation, Pittsburgh, Pa.

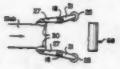
Division of Ser. No. 447,790, Dec. 8, 1982, Pat. No. 4,502,311. This application Jan. 22, 1985, Ser. No. 693,537

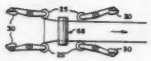
Int. Cl.[4] B21B *1/32, 15/00*

U.S. Cl. 72—206 **3 Claims**

1. The method of hot rolling a metal slab in a plurality of mill stands to a transfer bar of reduced thickness, reduced width and substantially rectangular plan comprising forging the leading end of the slab to taper it to an end width less than the

reduced width desired for the pass, thus upsetting the slab at that end, edge rolling the slab from the tapered end throughout its length, thereby further upsetting the slab and transferring upset metal into the voids left by said forging, rolling the edge rolled slab in a mill stand to reduce the thickness of and elongate the slab, thereby spreading it laterally, gradually reducing the edge rolling as the trailing end of the slab enters said thickness reducing mill stand, thereby allowing the trailing end to fan out to an increased width and to bulge rearwardly from its fanned edges, and edge rolling the trailing end of the slab to the desired width after it exits from the mill stand, thereby transferring metal to fill the corners of the fanned-out trailing end.





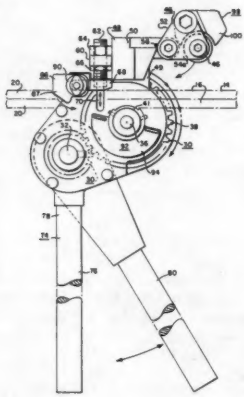
2. The method of hot rolling a metal slab in a plurality of mill stands to narrow the slab to a desired width and reduce trailing end fishtailing comprising edge rolling the slab, thus upsetting it, passing the edge rolled slab into a thickness reducing mill stand while the trailing end of the slab is being edge rolled, gradually reducing the trailing end edge rolling, thus allowing the trailing end to fan out to an increased width and bulge rearwardly from its fanned edges, and edge rolling only the trailing end of the slab only to said desired width after it exits from said thickness reducing mill stand, thereby causing sufficient fishtailing to fill the corners of the fanned trailing end.

4,587,824

CONDUCTOR BUNDLE EDGE-BENDING TOOL FOR A DYNAMOELECTRIC GENERATOR

Dale T. Wiersema, Bellevue, and Fred Kirschensteiner, Forest Hills, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 22, 1985, Ser. No. 736,994
Int. Cl.[4] B21D *7/02*
U.S. Cl. 72—217 **10 Claims**



1. A conductor bundle edge bending tool for a dynamoelectric generator, said generator having a plurality of winding coils, each of said coils having conductor bundle means including a plurality of elongated metallic conductors, each of said conductors having a thin substantially rectangular cross-section, said cross-section of each of said conductors having substantially equal dimensions and having a relatively wide face portion and a relatively narrow edge portion, said conductor bundle means including a plurality of layers of said conductors, each of said layers formed by a plurality of said conductors, each of said conductors of each of said layers disposed such that at least one face portion of each of said conductors is adjacent another face portion of another of said conductors and said edge portions of said conductors of each of said layers are aligned to form a top portion and a bottom portion of said layer, said layers stacked in predetermined position to form said conductor bundle means, said conductor bundle means having a top layer and a bottom layer, said tool comprising:

(a) gear means including a first shaft, said first shaft having a driver gear mounted thereon, a second shaft, said second shaft having a driven gear mounted thereon, said driven gear in operable engagement with said driver gear, gear housing means enclosing and supporting said driver gear and said driven gear;

(b) cylindrical mandrel means affixed to one end of said second shaft, said mandrel means positioned exterior of said gear housing means, said mandrel means in bending relationship with said conductor bundle upon engagement of said bundle with said tool;

(c) bending roller means comprising a cylindrical roller of predetermined dimensions, bracket means affixed to said driven gear, bending roller housing means including a front plate and a rear plate, said bending roller means mounted in predetermined position between said front and rear plates, said bending roller means rotatably hinged at one end of said bracket means to enable said bending roller to engage and disengage said conductor bundle;

(d) adjustable front clamp means comprising second bracket means, said second bracket means affixed to said gear housing, said adjustable clamp means engageable with said top portion of said top layer of said conductor bundle, said clamp positioned in predetermined position ahead of said mandrel means;

(e) adjustable guide means disposed in predetermined positions for prevention of lateral deformation of said conductor bundle means during bending of said bundle means;

(f) first handle means including an elongated handle member affixed at one end to said gear housing means;

(g) second handle means engaging the other end of said first shaft, whereby said conductor bundle means is positioned so as to contact said mandrel, said clamp means is adjusted to engage said top portion of said top layer of said conductor bundle means and said roller is positioned to engage said top portion of said top layer of said conductor bundle, said adjustable guide means is positioned adjacent said bundle means and said second handle is turned thereby forcing said bending roller means against said conductor bundle means causing said bundle means to bend around said mandrel, to form the bend desired, while said guide means prevents lateral deformation of said bundle means.

4,587,825

SHELL REFORMING METHOD AND APPARATUS

Joseph D. Bulso, Jr., Canton, and James A. McClung, North Canton, both of Ohio, assignors to Redicon Corporation, Canton, Ohio

Filed May 1, 1984, Ser. No. 605,920
Int. Cl.[4] B21D *22/00, 28/02*
U.S. Cl. 72—329 **11 Claims**

1. A method of forming a container end panel having a peripheral flange from a flat sheet of material comprising the steps of:

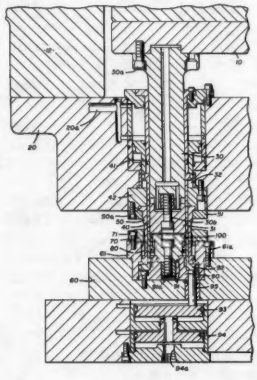
(a) blanking and drawing a reverse cup while holding the peripheral edge of the material under pressure;

(b) drawing the lip of the end panel and establishing an over length chuckwall; and

(c) releasing holding pressure on the peripheral edge and pulling metal from the chuckwall into the central panel of the end panel while simultaneously setting the chuckwall radius and reducing the length thereof.

5. Apparatus for forming a container end panel in a double acting press having movable inner and outer rams and a fixed platen, comprising:

(a) a punch core carried by the inner ram and die core carried by the fixed platen arranged in opposed relationship to said punch core;



(b) first pressure means carried by the outer ram and a die core ring carried by the fixed platen arranged in opposed relationship to said first pressure means;

(c) said first pressure means normally holding the end panel against said die core ring; and

(d) said first pressure means moved by said outer ram into engagement with said die core ring whereby continued movement of said outer ram causes said first pressure means and said die core ring to move together relatively of said fixed die core to reduce holding pressure on said end panel.

4,587,826

CONTAINER END PANEL FORMING METHOD AND APPARATUS

Joseph D. Bulso, Jr., Canton, and James A. McClung, North Canton, both of Ohio, assignors to Redicon Corporation, Canton, Ohio

Filed May 1, 1984, Ser. No. 605,888

The portion of the term of this patent subsequent to May 13, 2003, has been disclaimed.

Int. Cl.[4] B21D *22/00, 28/02*

U.S. Cl. 72—329 **7 Claims**

1. A method of forming a container end panel from a flat sheet of material comprising the steps of:

(a) blanking and drawing a reverse cup while holding the peripheral edge under pressure;

(b) drawing the lip of the end panel and establishing an overlength chuckwall; and

(c) releasing holding pressure on the peripheral edge and pulling material from the chuckwall into the central panel while simultaneously setting the chuckwall radius by pushing the central panel upwardly.

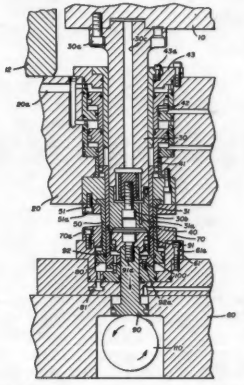
4. In a double acting press having inner and outer rams and an opposed platen and apparatus for forming the end panel of a container from a sheet of material, the improvement comprising:

(a) a punch core carried by the inner ram and a die core arranged in opposed relationship therewith;

(b) first pressure means carried by the outer ram and a die corcore ring arranged in opposed relationship therewith;

(c) said first pressure means normally holding the end panel against said die core ring during movement of the outer ram toward the fixed platen;

(d) said first pressure means terminating movement toward



said die core ring and relieving holding pressure on said end panel upon termination of movement of the outer ram toward the fixed platen; and

(e) means carried by the fixed platen for moving said die core toward said punch core as the inner ram and said punch core move away from the platen upon relief of holding pressure.

4,587,827

METHOD OF SHEET METAL PROCESSING

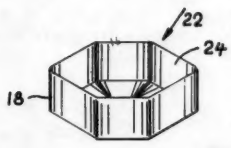
Ewald J. H. Wessels, Van Rheede, Alexandra Road, Wynberg 7700, South Africa

Filed Apr. 19, 1985, Ser. No. 725,113

Claims priority, application South Africa, Aug. 7, 1984, 84/6126

Int. Cl.[4] B21D *22/00*

U.S. Cl. 72—349 **6 Claims**



1. A method of drawing a circular metal cup from a metal sheet, comprising

providing a non-circular blank from a metal sheet,

drawing, in at least one drawing step, a non-circular cup from the non-circular blank in such a way that more stretching takes place in those areas of the blank where the perimeter is closer to the geometrical center of the blank than the stretching which takes place in those areas of the blank where the perimeter is further away from the geometrical center of the blank, and

drawing a circular cup from the non-circular cup.

4,587,828

ROUGH FORGING MOLD AND FINISH FORGING MOLD

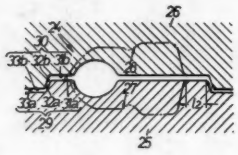
Kou Matsumoto, Kokubunji; Toshio Oota, Kawagoe; Yuji Asaka, Sayama, and Mitsuki Nakamura, Niiza, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 634,521, Jul. 26, 1984. This application Jul. 3, 1985, Ser. No. 751,407

Claims priority, application Japan, Jul. 26, 1983, 58-136283

Int. Cl.[4] B21D *22/00*

U.S. Cl. 72—356 2 Claims



1. A rough forging mold comprising upper and lower molds for a billet having its capacity distributed into a crank throw portion corresponding to a crank pin and balance weights on both sides thereof and into a journal portion, said crank throw portion having at an axially central portion on the outer periphery thereof formed with fitting grooves extending perpendicular to an axis of said crank throw portion and a diametral line thereof, wherein said upper and lower molds each have a crank pin forming recess, balance weight forming recesses on both sides thereof, and a journal forming recess, there are provided with raised portions between both the balance weight forming recesses of the upper and lower molds, these raised portions being formed inclined to define, when they are opposed to each other, a cavity which gradually enlarges towards the crank pin forming recess and being shaped to be fittable with said fitting grooves, and mutually opposed surfaces of the upper and lower molds are each formed with a first flat surface which extends substantially horizontally outwardly from an end edge of each of said recesses, an inclined offset surface inclined in either upper or lower direction outwardly from said flat surface, and a second flat surface which extends substantially horizontally outwardly from the inclined offset surface.

4,587,829

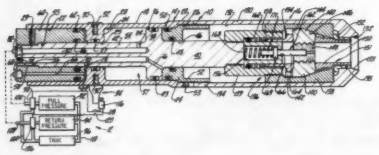
LIGHTWEIGHT, HIGH PRESSURE FASTENER INSTALLATION TOOL AND SYSTEM

Boris P. Sukharevsky, Fullerton, Calif., assignor to Huck Manufacturing Co., Irvine, Calif.

Filed Jul. 3, 1985, Ser. No. 751,686

Int. Cl.[4] B21J *15/34*

U.S. Cl. 72—391 19 Claims



1. In a fastening system for setting a fastener such as a lockbolt including a pin and a collar by applying a relative axial force between the pin and collar, said system comprising: an installation tool and a hydraulic power supply,

said installation tool including a piston-cylinder assembly and a removable nose assembly,

said piston-cylinder assembly comprising a one piece cylinder housing, said housing having an annular, radially extending separating wall located intermediate its ends and defining a forwardly opening cylinder cavity which is coaxially in line with a rearwardly opening cylinder cavity,

said piston-cylinder assembly further comprising an annular closure member located at the front end of said forwardly opening cylinder cavity to define therewith a forward cylinder,

said piston-cylinder assembly also comprising a tandem piston assembly including a first piston structure comprising a first piston head slidingly supported in said forward cylinder and integrally formed with a forwardly extending rod portion and a rearwardly extending rod portion, said forward rod portion slidingly supported in and extending through an opening in said closure member, said rearward rod portion slidingly supported in and extending through an opening in said separating wall, said tandem piston assembly further including a second piston structure comprising a second piston head secured to said rearwardly extending rod portion and slidably supported in said rearward cylinder cavity for reciprocal movement with said first piston structure,

said first piston structure and said closure member defining a front cylinder portion in said forward cylinder, said first piston structure and said separating wall defining a rear cylinder portion in said forward cylinder, said second piston structure and said separating wall defining in said rearward cylinder cavity a rearward cylinder operative only on the side of said second piston head connected to said rearward rod portion, said rearward cylinder being the only fluid cylinder defined in said rearward cylinder cavity and operative on said second piston structure,

said nose assembly including a plurality of jaws adapted to grip a pull portion of the pin and further including a swage anvil having a swage cavity adapted to engage the collar and to move over the collar and swage it radially inwardly onto the pin in response to a relative axial pull force between said jaws and said swage anvil as applied to the pin and collar, said swage cavity having a throat portion of a non-self releasing configuration,

first means connecting said swage anvil to said cylinder housing and second means connecting said forward rod portion of said piston-cylinder assembly to said jaws,

first fluid passage means in said piston-cylinder assembly for communicating said rearward cylinder and said front cylinder portion of said forward cylinder for simultaneously applying fluid pressure thereto from said hydraulic power supply to urge said first and second piston structures rearwardly to apply an axial pulling force to the fastener pin via said jaws and an axial reaction force to the collar via said swage anvil to set the fastener,

said first fluid passage means including a first fluid inlet and a first passageway connected to said first fluid inlet, said first passageway extending through said rearward rod portion and said first piston head,

second fluid passage means in said piston-cylinder assembly including a second fluid inlet for communication to said rear cylinder portion of said forward cylinder for applying fluid pressure thereto from said hydraulic power supply to urge said first piston structure forwardly to apply an axial pushing force to the end of the swaged fastener collar and an axial reaction force to said swage anvil to release the swaged collar from said swage cavity after the fastener has been set,

said hydraulic power supply having a pull pressure section for providing hydraulic pressure of a first preselected magnitude to said piston-cylinder assembly, a return pressure section for providing hydraulic pressure of a second preselected magnitude to said piston-cylinder assembly, and a tank section for providing a reservoir for fluid to be returned from said piston-cylinder assembly,

said hydraulic power supply including control valve means

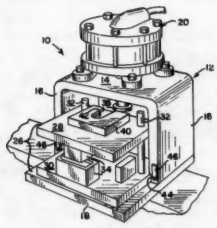
operable to a first condition for connecting said pull pressure section to said first fluid inlet of said piston-cylinder assembly for applying the relative axial pull force to set the fastener and for connecting said tank section to said second fluid inlet to receive fluid exhausted from said rear cylinder portion of said forward cylinder and operable to a second condition for connecting said return pressure section to said second fluid inlet of said piston-cylinder assembly for applying the relative axial pushing force for releasing the swaged collar from said swage cavity and for connecting said tank section to said first fluid inlet to receive exhausted fluid from said rearward cylinder and from said front cylinder portion of said forward cylinder, said second magnitude of hydraulic pressure being at least around 0.70 of said first magnitude of hydraulic pressure and with said relative axial pushing force being no less than around 0.30 of said relative axial pulling force.

4,587,830

PUNCH PRESS WITH QUICK-CHANGE DIE SET

Charles E. Mills, Rte. 1, Box 48, Reeds, Mo. 64859

Filed Jul. 15, 1985, Ser. No. 755,601
Int. Cl.[4] B21J 7/46
U.S. Cl. 72—442 **7 Claims**



1. A punch press construcion, comprising:

a generally inverted U-shaped frame having an upper frame web portion and a pair of spaced apart frame leg portions depending from respective opposite sides of said upper frame portion;

double-acting fluid actuator mans mounted on said upper web portion of said frame, said actuator means including a vertically reciprocable actuator piston rod extending downwardly through said upper frame portion;

a die set positionable within said press frame, said die set comprising an upper die plate and a lower die plate arranged in vertically spaced relation for relative vertical movement, said die plates being adapted to hold associated cooperating die elements; and

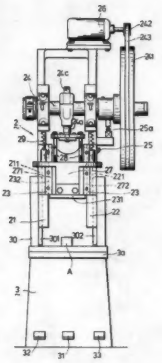
means for slidably mounting said die set in said press frame and for operatively connecting said actuator piston rod and said upper die plate whereby operation of said actuator means recipocates said piston rod to vertically reciprocate said upper die plate relative to said lower plate, said mounting means comprising coupling means mounted on the lower end of said actuator piston rod, and means defining a rearwardly opening cavity generally at the top of said upper die plate, said coupling means being slidably received in said cavity as said die set is slidably mounted in said press frame, said mounting means further comprising groove means defined by said pair of depending frame leg portions for slidably receiving opposite edge portions of said lower die plate and for holding said lower die plate against vertical movement with respect to said press frame.

4,587,831

PRESS MACHINE

Wen-Hsiung Yen, No. 14-3, La. 263, Wan Lee Rd., South District, Tainan, Taiwan

Filed May 20, 1985, Ser. No. 736,289
Int. Cl.[4] B21J 9/12
U.S. Cl. 72—453.03 **7 Claims**



1. A press machine comprising:

a machine body with a press bed which has two spaced apart upright guide member mounted thereon;

a frame having two legs which are slidably connected to said guide members respectively for moving up and down;

a hydraulically operating unit for raising and lowering said frame connected to said guide members;

a mechanically operating unit mounted on said frame;

a ramming means connected to said mechanically operating unit for moving upward and downward; and

a slide body slidably mounted on said frame between said legs and below said ramming mean, said slide body having a guide means at the top side thereof for guiding said ramming means while said ramming means is ramming said slide body, wherin said slide body can be moved downward until it contacts with a workpiece, before said ramming means delivers a blow, when said frame is lowered, and transmits the blow of said ramming means to the workpiece.

4,587,832

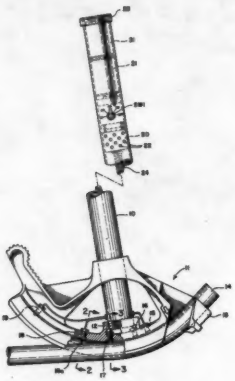
PIPE BENDING TOOL

Frank J. Illguth, P.O. Box 10452, Fairbanks, Ak. 99710

Filed Oct. 15, 1984, Ser. No. 661,030
Int. Cl.[4] B21D 7/14
U.S. Cl. 72—459 **19 Claims**

1. A hand operated tube bending tool, comprising a handle; a bending anvil secured to one end of the handle and having a tube securing means at one end thereof and a tube receiving area extending therealong from the tube securing means so that as a tube is bent it contacts at least a portion of the tube receiving area, the portion contacted being greater the greater the angle of the bend being formed in the tube and the portion contacted being a measure of the degree of bend formed in the tube; a plurality of electrical sensing means spaced along the tube receiving area so that as predetermined portions of the tube receiving area are contacted, successive sensing means change electrical state; electrically operated indicator means;

selector means for selecting which sensing means will cause activation of the indicator means upon that sensing means



changing state; and means for supplying power to the indicator means when the indicator means is activated.

4,587,833

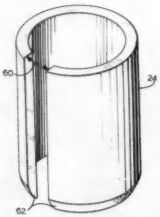
STAKING SYSTEM

Eugene R. Speakman, Fullerton, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Continuation of Ser. No. 539,474, Oct. 6, 1983, abandoned, which is a continuation-in-part of Ser. No. 516,861, Jul. 25, 1983, abandoned. This application Dec. 24, 1984, Ser. No. 684,988

Int. Cl.[4] B21D *37/00*

U.S. Cl. 72—465 **2 Claims**



1. A self-aligning staking anvil comprising a hallow, cylindrical tool element having a working edge beveled appropriately to stake at least one web adjacent a circular staking groove in a workpiece to a receiving beveled surface wherein the tool element has a gap in its circumference substantially perpendicular to its working edge of sufficient width such that the staking anvil has sufficient strength to resist longitudinal deformation under normal usage but will change its effective diameter by self-adjustment of the width of the gap during a staking operation to accommodate a variety of workpieces having staking grooves of differing diameters but with the requirement for the same working edge bevel.

4,587,834

METHOD AND APPARATUS FOR ANALYZING GASES DISSOLVED IN A LIQUID SAMPLE

David J. Fisher, North Adams, Mass., assignor to General Electric Company, King of Prussia, Pa.

Filed Mar. 7, 1985, Ser. No. 709,253

Int. Cl.[4] G01N *30/00*

U.S. Cl. 73—23.1 **25 Claims**

1. Gas chromatographic apparatus for analyzing gases dissolved in a liquid, said apparatus comprising, in combination:

a. means for holding a predetermined volume of the liquid as a liquid sample;

b. a gas chromatograph for qualitatively and quantitatively analyzing the gases dissolved in said liquid sample;

c. a source of primary carrier gas;

d. a degassing chamber comprising a vertically oriented, elongated tube having openings in its upper and lower ends and containing a number of discrete packing elements, and

e. means for connecting said holding means and said degassing chamber in series between said primary carrier gas source and said gas chromatograph, whereby said primary carrier gas forces said liquid sample from said holding means into said tube via said lower end opening thereof where it forms a surface coating on said packing elements, said primary carrier gas sweeping upwardly through said tube to extract the gases from solution in said liquid sample, said extracted gases being propelled by said primary carrier gas from said tube via said upper end opening thereof to said gas chromatograph for analysis.

4,587,835

LIGHT PIPE AND HEATER APPARATUS

Gary E. Adams, Danbury, Conn., assignor to International Business Machines Corp., Armonk, N.Y.

Filed Jan. 9, 1985, Ser. No. 690,073

Int. Cl.[4] G01N *30/74*

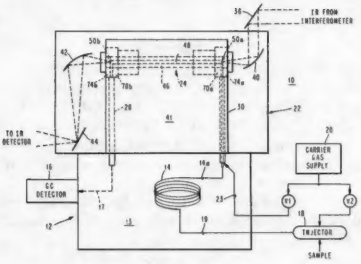
U.S. Cl. 73—23.1 **25 Claims**

1. In a GC/IR system for analyzing the constituents of a gas sample including an IR spectrometer for providing IR energy through a passageway in a light pipe tube, a GC capillary column for separating a sample into constituents, and a supplemental detection means and a carrier gas provided by a carrier gas input means, the combination comprising:

a heater assembly including a heater chamber having a first and second trough therein and a bore therethrough, and

a floating light pipe assembly including said light pipe tube removably disposed in said bore and first and second transfer tube means removably disposed in said first and second troughs for providing a chemically inert flow path for transferring said constituents of a gas sample from said GC capillary column, which is removably connected to said first transfer tube means, to said supplemental detec-

tion means, which is removably connected to said second transfer tube means, whereby said heater assembly in combination with the high velocity of said sample in said



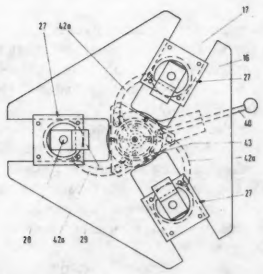
light pipe assembly minimizes the temperature drop of said gas sample while passing through said floating light pipe assembly which maintains high reflectivity in the IR region.

4,587,836

TEST STAND FOR A VALVE

Kelvin J. R. Hewlett, Market Harborough, United Kingdom, assignor to Crosby Valve & Engineering Company Limited, Leicestershire, United Kingdom

Filed Oct. 2, 1984, Ser. No. 657,001
Int. Cl.[4] G01M *3/28*
U.S. Cl. 73—49.8 **14 Claims**



1. A test stand for the pressure testing of a valve which comprises:

a flat support defining a valve testing station onto which a port of a valve can be placed;

means provided in said support for directing a test fluid pressure medium into said port when the valve is placed on the support;

a set of jaws uniformly spaced around the testing station, each jaw being mounted for slideable movement along a respective radial guide;

means for applying joint movement to the jaws along the respective guides between a release position in which a valve can be placed on, or removed from the testing station, and a locating position in which the jaws engage with the valve, or a part connected to the valve, in order to centralize the valve between the jaws on the testing station;

a respective operating cylinder coupled with each jaw and movable therewith during joint movement of the jaws along the guides, each cylinder being operable to move the respective jaw in a direction towards the support in a valve hold-down mode of the test stand; and

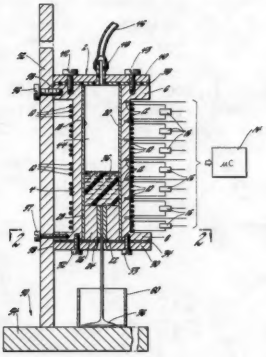
means operable, in the hold-down mode, to supply fluid energy simultaneously to all of the operating cylinders, when the jaws are in said locating position, so that the jaws hold-down the valve on the testing station prior to pressure testing of the valve.

4,587,837

CAPILLARY RHEOMETER HAVING DISPOSABLE CAPILLARY TUBE

John Newbould, Fraser, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 17, 1985, Ser. No. 692,123
Int. Cl.[4] G01N *11/08*
U.S. Cl. 73—56 **2 Claims**



1. In a device for measuring the rheometric properties of molten polymeric materials by expressing them through a capillary, the improvement comprising a barrel surrounded by a plurality of electrical heating elements which are automatically controlled to maintain a constant temperature along the length of the barrel; a liner which fits securely in the bore of the barrel for retaining a polymeric sample; a disposable capillary tube having a capillary through which the polymeric sample is extruded by application of positive gas pressure above the sample; a capillary tube holder which fits in sealing relation between the said liner and the capillary tube; and a separate bottom plate which prevents the capillary tube from moving when said polymeric material sample is extruded therethrough, wherein said device, the said liner, capillary tube, and tube holder may be readily removed and replaced by like components to facilitate quick sample changes and easy cleaning thereof.

4,587,838

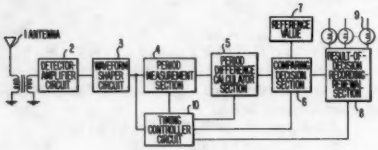
AUTOMATIC EXAMINATION SYSTEM FOR MOTOR VEHICLES

Kenji Sakai; Takeshi Wakabayashi, both of Nagoya; Kakumasa Fukuzawa, Tokyo, and Teruzo Hiraoka, Hachioji, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha and Chuo Denshi Kabushiki Kaisha, both of Tokyo, Japan

Filed May 15, 1984, Ser. No. 610,816
Int. Cl.[4] G01M *15/00*
U.S. Cl. 73—116 **3 Claims**

1. An automatic examination system for motor vehicles comprising: a receiver section fixedly mounted on a floor of an examination station and disposed apart from an engine of a motor vehicle for receiving via space either electrical signals or sonic signals transmitted from said engine; a period measurement section for measuring the respective periods between said respective signals received by said receiver section; a period difference calculator section for calculating the respective period differences between said respective periods measured

by said period measurement section; and a good/bad decision section for deciding whether said engine is good or bad by comparing said respective period differences calculated by the period difference calculator section with a given reference value.



4,587,839

TOP DEAD CENTER MEASUREMENT FOR RECIPROCATING CRANK MECHANISM

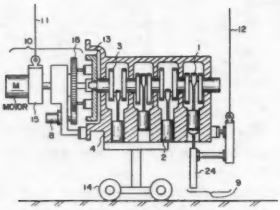
Tabito Doniwa, Hachioji, Japan, assignor to Daiichi Dentsu Kabushiki Kaisha, Chofu, Japan

Filed Jul. 3, 1984, Ser. No. 627,409

Claims priority, application Japan, Jul. 4, 1983, 58-120350

Int. Cl.[4] G01M *15/00*

U.S. Cl. 73—117.2 **1 Claim**



1. A method for measuring top dead center for a reciprocating crank mechanism, comprising:

first step for driving the crankshaft of the reciprocating mechanism in one direction and then driving the same in the reverse direction when the amount of shift of the piston has reached the predetermined value H+A;

second step for resetting to zero the counting state of a reversible counter when the amount of shift of the position has reduced the predetermined value H in the reverse driving direction of the crankshaft;

third step for starting and additively counting the counting state of the reversible counter after the resetting thereof for each predetermined unit rotational angle deviation of the crankshaft until the amount of shift of the piston has reached the predetermined value H+A in the reverse driving direction of the crankshaft;

fourth step for again driving the crankshaft in said one driving direction when the amount of shift of the piston has reached the predetermined value H+A;

fifth step for subtractively performing the counting operation of the reversible counter for each predetermined unit rotational angle deviation of the crankshaft until the amount of shift of the piston has reached the predetermined value H in said one driving direction of the crankshaft;

sixth step for subtractively performing the counting operation of the reversible counter for each one-half the predetermined unit rotational angle deviation of the crankshaft after the amount of the shift of the piston has reached the predetermined value H in said one driving direction of the crankshaft; and

seventh step for deciding a position of the piston as the top dead center when the counting state of the reversible counter reaches zero in said one driving direction of the crankshaft.

4,587,840

PRESSURE SENSOR FOR INSTALLATION IN A WALL ELEMENT SUBJECTED TO PRESSURE OF A FLUID MEDIUM, SUCH AS A HYDRAULIC PRESSURE LINE, E.G. IN DIESEL FUEL INJECTION SYSTEMS

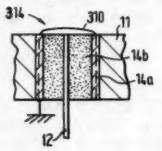
Klaus Dobler, and Werner Grünwald, both of Gerlingen, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 5, 1984, Ser. No. 627,917

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1983, 3332880

Int. Cl.[4] G01M *15/00*

U.S. Cl. 73—119 A **21 Claims**



1. Pressure sensor to determine fluid pressure against a wall (11) having

a layer or film-type pressure-responsive resistance element (10) and a support for said layer or film-type resistance element,

wherein, in accordance with the invention,

the support for said layer or film-type resistance element comprises, at least in part, a pressure-resistant, essentially unyielding electrically insulating material (14, 214, 314, 414, 514, 614, 17, 11*a*, 11);

and at least one electrical conductor (12, 13) passing through and sealed into the pressure-resistant, essentially unyielding electrically insulating support, terminating beneath the surface of the layer or film-type pressure-responsive resistance element exposed to said fluid pressure, and electrically connected to said layer or film-type pressure-responsive resistance element (10),

said pressure-resistant electrically insulating support forming, simultaneously, an essentially unyielding carrier substrate for the layer or film-type pressure-responsive resistance element and an insulator for the at least one electrical conductor extending therethrough.

4,587,841

HYDRODYNAMIC TEST APPARATUS

Jean-Luc Giovachini, Paris; Jean-Paul Varnier, Versailles; Jean-Claude Dern, Paris; Pierre-Loïc Le Guet, Bures sur Yvette, and Jean-Pierre Pascal, Paris, all of France, assignors to Etat Francais, Paris, France

Filed Feb. 20, 1985, Ser. No. 703,481

Claims priority, application France, Feb. 22, 1984, 84 02647

Int. Cl.[4] G01M *10/00*

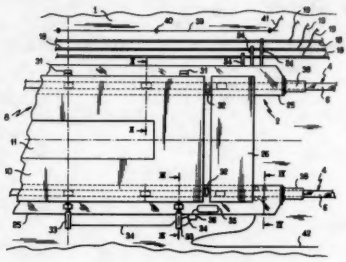
U.S. Cl. 73—148 **15 Claims**

1. A hydrodynamic test apparatus for use in a tank filled with water in which a test model support is immersed, comprising:

a frame having rollers resting on the bottom of said tank;

a removable plate, said removable plate being attached to said frame; and,

a linear induction motor, said linear induction motor being attached to said frame and being supplied with electric



current from conductor rails affixed to the bottom of said tank.

4,587,842

ARRANGEMENT FOR MEASURING THE MASS FLOW-RATE OF A FLOWING MEDIUM

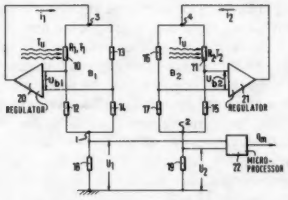
Dieter Handtmann, Sindelfingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 21, 1983, Ser. No. 553,643

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1982, 3248603

Int. Cl.[4] G01F *1/68*

U.S. Cl. 73—204 **14 Claims**



1. An arrangement for determining the mass rate of flow of a flowing medium such as the mass rate of flow of air required by an internal combustion engine during the combustion process, the arrangement comprising:

first balancing circuit means incorporating a first temperature-dependent resistor for supplying current thereto to heat the same to a first predetermined temperature;

said first temperature-dependent resistor being disposed in the flowing medium whereby changes in the heat transferred thereto from said first resistor causes said first balancing circuit means to become unbalanced;

second balancing circuit means incorporating a second temperature-dependent resistor for supplying current thereto to heat the same to a second predetermined temperature different from said first temperature;

said second temperature-dependent resistor being disposed in the flowing medium whereby changes in the heat transferred thereto from said second resistor causes said second balancing circuit means to become unbalanced;

adjusting circuit means for adjusting said currents in response to changes in the heat transferred to the medium to thereby heat said resistors to maintain said respective temperatures constant and to thereby rebalance said balancing circuits, said heats transferred and said currents being a function of the mass rate of flow of the medium and of the temperature thereof;

signal circuit means for providing respective signals indicative of said currents;

said adjusting circuit means including: a first analog-to-digital converter connected to the output of said first balancing circuit means for converting the output voltage thereof into pulses, said first converter having an output connected to ground through said first balancing circuit means to supply said pulses thereto to heat said first resistor to maintain the same at said first temperature; and, a second analog-to-digital converter connected to the output of said second balancing circuit means for converting the output voltage thereof into pulses, said second converter having an output connected to ground through said second balancing circuit means to supply said pulses thereto to heat said second resistor to maintain the same at said second temperature; and,

means for combining the pulses of said digital converters to provide a signal indicative of said mass rate of flow of said flowing medium which is independent of the temperature thereof.

4,587,843

THERMOCOUPLE-TYPE GAS-FLOW MEASURING APPARATUS

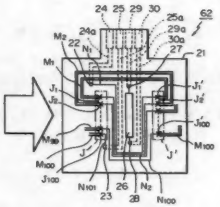
Norihito Tokura, Aichi; Hisasi Kawai, Toyohashi; Kenji Kanehara, Aichi, and Tokio Kohama, Nishio, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Jun. 20, 1984, Ser. No. 622,554

Claims priority, application Japan, Jun. 23, 1983, 58-113978

Int. Cl.[4] G01F *1/68*

U.S. Cl. 73—204 **8 Claims**



1. An apparatus for measuring the flow rate of gas through a gas passage, comprising:

a plate substrate disposed within said gas passage and parallel to the gas stream thereof;

a thin film heater, formed on one surface of said plate substrate, for heating the gas flowing therethrough;

a plurality of first conductive thin film layers formed on said one surface of said plate substrate, each of said first conductive thin film layers being separated electrically from each other and having ends at the upstream and downstream of said thin film heater with respect to the direction of gas flow;

a plurality of second conductive thin film layers formed on said one surface of said plate substrate, each of said second conductive thin film layers being separated electrically from each other and said first conductive thin film layers and having ends at the upstream and downstream of said thin film heater with respect to the direction of gas flow;

a plurality of upstream thermojunctions serially connecting said ends of said first conductive thin film layers at the upstream of said thin film heater with said ends of said second conductive thin film layers at the upstream of said thin film heater;

a plurality of downstream thermojunctions serially connecting said ends of said first conductive thin film layers at the downstream of said thin film heater with said ends of said second conductive thin film layers at the downstream of said thin film heater;

said upstream thermojunctions and said downstream thermojunctions being connected in series so that a total of upstream electromotive forces generated by said upstream thermojunctions in accordance with the temperature of the gas on the upstream side of said thin film heater and downstream electromotive forces generated by said downstream thermojunctions in accordance with the temperature of the gas on the downstream side of said thin film heater is generated; and

an electric circuit means, connected to said thin film heater and said first and second conductive thin film layers, for controlling electric power supplied to said thin film heater in accordance with said total of said upstream electromotive forces and downstream electromotive forces,

wherein said first conductive thin film layers extend outwardly from respective ends thereof and bypass one end of said thin film heater, and said second conductive film layers extend inwardly from respective ends thereof and bypass the other end of said thin film heater so that crossing of said first conductive thin film layers with said second conductive thin film layers is prevented.

4,587,844

FLOW RATE METER

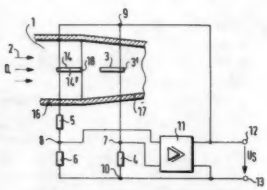
Jaihind S. Sumal, Vaihingen-Ensingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 19, 1985, Ser. No. 713,718

Claims priority, application Fed. Rep. of Germany, May 10, 1984, 3417305

Int. Cl.[4] G01F *1/68*

U.S. Cl. 73—204 **4 Claims**



1. An apparatus for measuring the aspirated air mass of internal combustion engines, comprising a measuring resistor layer disposed in a flow cross section on a first carrier of approximately rectangular cross section having a longitudinal extent arranged parallel to the flow direction, a second resistor layer disposed in said flow cross section on a second carrier of approximately rectangular cross section having a longitudinal extent parallel to said flow direction, said flow cross section further having one parallel section and a continuous convergent section, said second carrier having said resistor layer arranged to serve as a compensating resistor disposed in alignment with and upstream from said first carrier wherein said second carrier is located in the parallel section of the flow cross section and said first carrier having said measuring resistor layer is located in the convergent section of said flow cross section.

4,587,845

LIQUID LEVEL SIGHT GAUGE

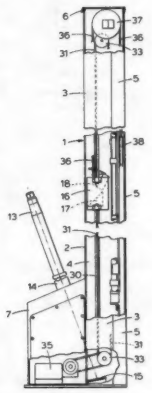
Otto H. Varga, Bradford-on-Avon, Great Britain, assignor to Seetru Ltd., Bristol, England

Filed Oct. 15, 1984, Ser. No. 661,220

Claims priority, application United Kingdom, Oct. 27, 1983, 8328664

Int. Cl.[4] G01F *23/02*

U.S. Cl. 73—325 **12 Claims**



1. In a sight gauge for determining liquid level comprising in combination:

a least one sight tube,

a scale mounted adjacent and parallel to said sight tube, and periscope means including a fixed telescope, a fixed mirror, an optical carriage, a mobile reflective member mounted on said optical carriage and means mounting said carriage for movement over and along the adjacent sight tube and scale for aligning said mobile reflective member along said sight tube for viewing liquid levels within the sight tube and for measuring the levels against the scale over a predetermined metering range:

the improvement comprising a substantially lightproof closed tubular casing formed of at least one cover member and enclosing the sight tube, scale and optical carriage;

means for illuminating the sight tube and scale within said casing, at least at the level of said optical carriage with the periscope means mounted in the casing for viewing the scale;

the sight tubing being formed of a plurality of lengths of tubing, each length of tubing forming the sight tube having flanged ends, said lengths of tubing being longitudinally aligned end-to-end and having aligned internal surfaces, and means connecting the flanged ends of adjacent lengths of tubing, said means connecting the flanged ends comprising a resilient sealing ring between the connected flanged ends, said resilient sealing ring having an internal surface substantially flush with the aligned internal surfaces of the lengths of tubing, and threaded collar means captive on said lengths of tubing.

4,587,846

MEASURING DEVICE FOR MEDICINAL PRODUCTS IN POWDER OR GRANULAR FORM

Concepción Coma Juliá, Ganduxer 22, Barcelona, Spain

Filed Aug. 27, 1984, Ser. No. 644,813

Claims priority, application Spain, Mar. 7, 1984, 278.014

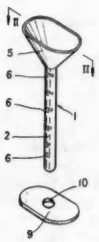
Int. Cl.[4] G01F *19/00*; G01N *5/00*

U.S. Cl. 73—426 **8 Claims**

1. A measuring device for medicinal products in powder or granular form comprising:

a clear transparent tubular body portion having a closed end and an open end, said tubular body portion having an inner cavity extending from said open end to a bottom surface defined by an inner surface of said closed end, said cavity having an upper portion of a constant predetermined diameter and a lower portion of a constant diameter smaller than the predetermined diameter of said upper portion;

an integral outwardly tapering hopper portion extending at the open end of said tubular body portion;



a stand removably attached to the closed end of said tubular body portion for supporting said tubular body portion in a vertical position; and

said tubular body portion being provided with graduation marks calibrated such that the volume of the cavity, as indicated by the graduation marks, corresponds to the weight of active substance contained in the medicinal product, the graduation marks on said lower portion having a greater number of divisions to provide a greater accuracy of measurement.

4,587,847

METHOD FOR INDICATING CONCEALED DEPOSITS

Erik L. Malmqvist, Båstad, and Krister Kristiansson, Lund, both of Sweden, assignors to Boliden Aktiebolag, Stockholm, Sweden

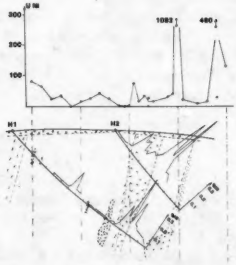
PCT No. PCT/SE82/00306, § 371 Date May 23, 1983, § 102(e) Date May 23, 1983, PCT Pub. No. WO83/01309, PCT Pub. Date Apr. 14, 1983

PCT Filed Sep. 30, 1982, Ser. No. 509,448

Claims priority, application Sweden, Oct. 7, 1981, 8105923

Int. Cl.⁴ G01N *33/24*

U.S. Cl. 73—432 R **23 Claims**



1. A method for indicating the presence of concealed solid or liquid minerals or deposits, or both, in prospecting or exploration operations, characterized by directing a flow of ascending free geogas to a sampling device; separating and collecting any entrained solid or liquid substances including ions, atoms and aggregations of atoms; and analyzing the separated substances in order to determine the quantity of separated substances and identify solid or liquid minerals or deposits or both of explorational interest, on a basis of a transport mode of said substances being based substantially on said flow of said ascending free geogas.

4,587,848

MECHANISM FOR ATTACHING ULTRASONIC HEAD OF ULTRASONIC MICROSCOPE

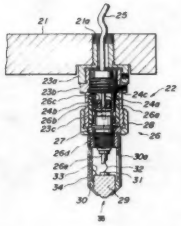
Yu. Nakamura; Fumio Uchino; Hitoshi Tateoka, and Junichi Ishibashi, all of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 24, 1984, Ser. No. 664,429

Claims priority, application Japan, Nov. 2, 1983, 58-204712

Int. Cl.⁴ G01N *29/04*

U.S. Cl. 73—632 **9 Claims**



1. A mechanism for attaching an ultrasonic head to an ultrasonic microscope main body, comprising

a first connecting means fixedly arranged to the ultrasonic microscope main body, to which an R.F. cable is connected; and

second connecting means having an ultrasonic head coupled therewith and being detachably attached to said first connecting means.

4,587,849

COEXTRUSION INSPECTION SYSTEM

R. Michael Gross, Muncie, Ind., assignor to Ball Corporation, Muncie, Ind.

Filed Feb. 28, 1985, Ser. No. 706,689

Int. Cl.⁴ G01N *29/04*

U.S. Cl. 73—644 **25 Claims**

1. Acoustic inspection apparatus comprising:

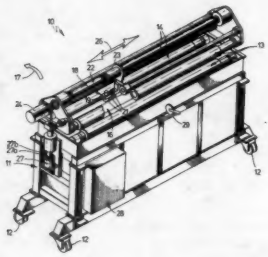
an acoustic transducer having a transducer face;

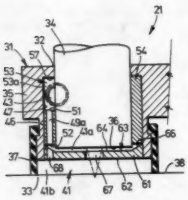
means for supporting said transducer in spaced relationship with respect to an article to be inspected and for defining a fluid chamber between the face of said transducer and the article to be inspected;

means for supplying an interfacing fluid to said fluid chamber;

fluid directing means positioned within said chamber between the face of said transducer and the article to be inspected, said fluid directing means including a surface for directing said interfacing fluid substantially trans-

versely across the face of said transducer from at least one peripheral location; and





means located above said fluid-directing means for removing interfacing fluid and any air bubbles carried thereby from said chamber.

4,587,850

ARRANGEMENT FOR DETERMINING THE TRAVEL OF A PISTON

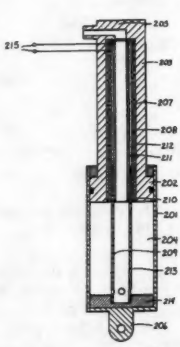
Bernd Moser, Wissen, Fed. Rep. of Germany, assignor to Boge GmbH, Eitorf, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 621,075, Jun. 15, 1984. This application Sep. 24, 1984, Ser. No. 653,930

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1983, 3334636; Oct. 22, 1983, 3338443

Int. Cl.[4] G01R *27/26*

U.S. Cl. 73—658 **21 Claims**



1. A damping cylinder in a vibration damper, said cylinder having an arrangement for measuring relative travel of a piston in said cylinder, comprising:

a supporting member housing a first electrode which is mounted substantially fixed but substantially electrically insulated with respect to the supporting member;

a second electrode spaced from the first electrode to define a space therebetween, said second electrode being substantially fixed with respect to the first electrode said first and second electrodes in use forming a capacitative reactance;

a reactance varying member which is mounted to move in accordance with said relative travel between the pistion and the cylinder, said reactance varying member being so disposed that its movement changes the capacitance between said first and second electrodes in accordance with said relative movement between the piston and the cylinder; and

electrical connecting means connected to said fixed first and second electrodes for measuring the capacitance formed therebetween and for producing in use a signal indicative of relative movement between the piston and the cylinder.

4,587,851

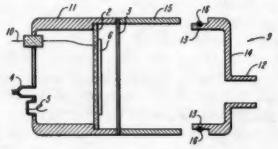
HIGH VACUUM CAPACITANCE MANOMETER HAVING PX SIDE OPEN HOUSING

Edward Mortberg, 2 Westgate Dr., #207, Woburn, Mass. 01801

Filed Feb. 26, 1985, Ser. No. 705,570

Int. Cl.[4] G01L *9/12*

U.S. Cl. 73—724 **8 Claims**



1. A sensor unit for a high vacuum capacitance manometer, of the type having an integral vacuum reference chamber, such unit comprising:

a diaphragm having first and second sides and a periphery;

a reference chamber fused to the diaphragm along its periphery on the first side, and including an electrode and means for securing said electrode in a fixed position with respect to the diaphragm;

a wall ring fused to the diaphragm along its periphery on the second side and extending outwardly therefrom to an outer edge; and

cap means for removably capping the wall at its outer edge so as to provide a closed pressure receiving chamber with the second side of the diaphragm constituting an inner surface thereof, such cap means being non-destructively removable so as to provide, when removed, access to substantially the entire second side of the diaphragm for cleaning and visual inspection thereof.

4,587,852

CONVEYOR BELT TENSION SENSING

Joseph W. Butler, Appleby Magna, and Edward E. Jarvis, Mickleover, both of England, assignors to Coal Industry (Patents) Limited, London, England

Filed Jun. 20, 1984, Ser. No. 622,644

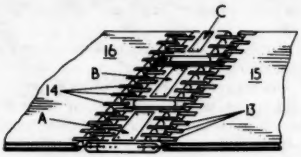
Claims priority, application United Kingdom, Jun. 21, 1983, 8316859

Int. Cl.[4] G01N *3/08*

U.S. Cl. 73—826 **12 Claims**

1. A method of sensing tension in a conveyor belt having at least one connecting joint including joint components provided on the ends of both connected belt portions, comprising the steps of mounting a sensor for sensing tensile force between the joint components provided on the ends of both connected

belt portions, deriving a signal from the sensor which is indicative of sensed tensile force, and transmitting a signal dependent



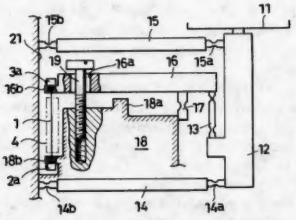
on the derived signal, wherein the signal is transmitted by a radio transmitter.

4,587,853

VIBRATION TYPE FORCE DETECTOR

Akira Komoto, Otsu, and Akira Nishio, Nagaokakyo, both of Japan, assignors to Shimadzu Corporation, Kyoto, Japan

Filed Nov. 21, 1984, Ser. No. 673,666
Claims priority, application Japan, Dec. 14, 1983, 58-236751
Int. Cl.[4] G01L *1/10*
U.S. Cl. 73—862.59 **2 Claims**



1. A vibration type force detector for detecting force through measurement of the natural frequency of a vibration string made of a platinum-based alloy containing nickel and through a device to vibrate with a force to be measured arranged so as to contribute to the tension of said vibration string, said vibration type force detector comprising:

a first string-fixing means for fixing one end of said vibration string to a projection provided on a base portion of said vibration type force detector;

a second string-fixing means for fixing another end of said vibration string to one end of a force transmitting lever for transmitting said force to be measured to said vibration string so that said vibration string is given a tension proportional to said force to be measured, said first and second string-fixing means consisting of a pair of clamping pieces which are encased in a box type casing, a spring for pushing said clamping pieces vertically on a base disc having a through hole at the center thereof through which said string extends and a spring lid secured to said casing so as to keep said clamping pieces fixed to an inner wall of said casing;

a magnetic field applied to said vibration string to cause a vibrating voltage to develop across said vibration string when the string vibrates; and

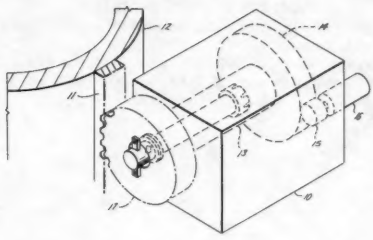
a positive feedback amplifier for constituting an oscillator circuit together with said vibration string so as to make said vibration string continue to vibrate at a frequency determined by the tension applied thereto.

4,587,854

LIFTING APPARATUS

Robert A. Fry, 910 Forsythe La., Houston, Tex. 77073

Filed Jul. 5, 1984, Ser. No. 628,032
Int. Cl.[4] G01L *3/10*
U.S. Cl. 73—862.31 **5 Claims**



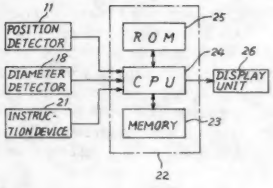
1. In apparatus having one member which is to be lifted with respect to another supported member, a rack extending vertically along a first of the members, a shaft rotatably mounted on the second member, said shaft having a pinion gear on one end engageable with the rack and a bore extending inwardly from its one end, drive means engageable with the other end of the shaft for rotating it, a rod extending within the bore having one end mounted on the shaft within the bore to prevent its rotation with respect to the shaft, and means on the one end of the shaft and other end of the rod for measuring the extent of rotation of said one end of the shaft with respect to the other end of the rod.

4,587,855

TENSIONMETER

Yoji Yamada, Uesatominaminomachi; Michinori Matsuura, Shiga, and Yoshiaki Kakeshita, Kyoto, all of Japan, assignors to Shimpo Kogyo Kabushiki Kaisha, Kyoto, Japan

Filed Feb. 15, 1985, Ser. No. 702,132
Int. Cl.[4] G01L *5/10*
U.S. Cl. 73—862.48 **3 Claims**



1. A tensionmeter comprising:

(a) a pair of guide rollers spaced a predetermined distance apart from each other;

(b) a sensing roller interposed between said pair of guide rollers and being displaceable by the tension of an elongated object to be measured, said object extending in contact with said guide rollers and said sensing roller;

(c) first detecting means for detecting the amount of displacement of said sensing roller caused by the tension of said elongated object;

(d) second detecting means for detecting the diameter or thickness of said elongated object;

(e) means for conducting operations on the detected values from said first and second detecting means to obtain an ideal amount of displacement of said sensing roller provided that the material of said elongated object has no rigidity; and

(f) means for calculating a tension as a function of said ideal amount of displacement of said sensing roller as the variable and considering said calculated tension as the tension of said object.

4,587,856

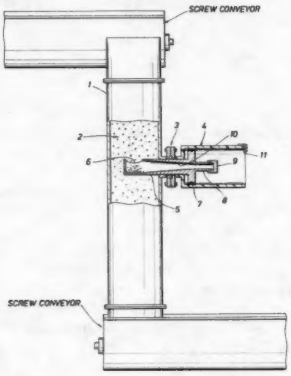
NON-POLLUTING SAMPLER

Bradley A. Otis, Webster, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 597,763, Apr. 6, 1984, abandoned. This application Aug. 23, 1985, Ser. No. 768,186

Int. Cl.[4] G01N *1/20*

U.S. Cl. 73—863.51 **4 Claims**



1. Apparatus for sampling pneumatically and/or gravitationally conveyed particulate said material moving generally downward through a chute without allowing significant portions of gas or dust to be displaced into or out of the chute, comprising:

a substantially full opening knife gate valve connected between an opening in the wall of the chute and an opening into an open ended tube, with that valve arranged for confining gas and dust within the chute when the valve is closed and the open ended tube is empty;

a readily detachable tubular canister arranged to have a sample receiving chamber in which there is an open inlet but not an open outlet for receiving and retaining solid particles amounting to a sample having a size limited to a selected magnitude near its front and a seal capable of slidably engaging the interior of the open ended tube near its rear, said canister having dimensions arranged so that the seal can engage the tube wall when the canister is within the tube with the valve closed, the canister sample receiving chamber can be advanced through the valve and into the chute when the valve is open, and the seal can remain in engagement with the tubing wall during the advancing of the sample receiving chamber into the interior of the chute; and

means for operating the valve and moving the canister.

4,587,857

METHOD FOR MOUNTING POORLY CONSOLIDATED CORE SAMPLES

Darrell C. Bush, Colleyville, Tex., assignor to Western Geophysical Company of America, Houston, Tex.

Filed Oct. 18, 1984, Ser. No. 662,279

Int. Cl.[4] G01N *1/28*

U.S. Cl. 73—863 **25 Claims**

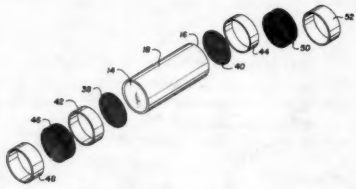
1. A method of mounting unconsolidated or poorly consolidated core samples to provide a mounted core sample suitable for testing at no less than 2500 psi net confining pressure, said method comprising the steps of:

providing a poorly consolidated core sample of cylindrical shape and of predetermined length and having a first end and a second end;

inserting said poorly consolidated core sample into a predetermined length of a first cylindrical shaped, heat shrinkable tubing of predetermined diameter, said predetermined length of said first cylindrical shaped, heat shrinkable tubing being at least as great in length as said poorly consolidated core sample;

placing an end plug at each of said first and second ends of said poorly consolidated core sample within said predetermined length of said first cylindrical shaped, heat shrinkable tubing;

applying heat to said first cylindrical shaped, heat shrinkable tubing to cause said first cylindrical shaped, heat shrinkable tubing to conform to the outer circumferential surface of the poorly consolidated core sample and the end plugs;



cutting said first cylindrical shaped, heat shrinkable tubing off at each of said first and second ends at the line of contact between the poorly consolidated core sample and each end plug;

placing a first screen of a first predetermined mesh size against said first end of said poorly consolidated core sample:

placing a solid seating plug against said first screen;

placing a second screen of a second predetermined mesh size against said second end of said poorly consolidated core sample;

placing a seating plug with a predetermined number of passageways therethrough against said second screen such that said predetermined number of passageways will accommodate displaced fluids in the poorly consolidated core sample; and,

loading the poorly consolidated core sample hydrostatically in a manner to sufficiently seat the poorly consolidated core sample.

4,587,858

CROSSCUT SAMPLER WITH AUGER CLEAN OUT

Donald O. Bartholomay, St. Louis Park, Minn., assignor to Gustafson, Inc., Dallas, Tex.

Filed Jan. 28, 1985, Ser. No. 695,620

Int. Cl.[4] G01N *1/20*

U.S. Cl. 73—863.53 **8 Claims**

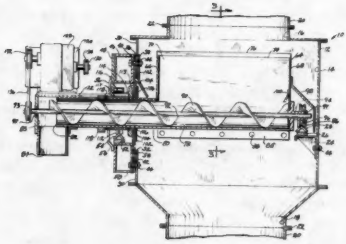
1. A crosscut sampling apparatus for obtaining a representative sample of a downwardly flowing stream of dry material, comprising

(a) a pelican for catching and holding the sample having a top wall with a receiving slot, a front wall, a bottom for collecting the sample and a discharge outlet in the front wall adjacent the bottom for unloading the sample therethrough from the bottom of the pelican;

(b) a housing enclosing the pelican and having top and bottom openings for splicing the housing into a gravity feed flow duct containing the downwardly flowing stream of dry material, a side wall and an elongate generally horizontal hole in the side wall in alignment with the discharge outlet for unloading the crosscut sample therethrough from the pelican;

(c) a support and guide structure for movably mounting the pelican;

(d) drive means connected to the pelican for moving the pelican along the support structure passing the receiving slot through and beyond the stream to collect the crosscut sample; and



(e) an auger within the pelican on the bottom adjacent the dischange outlet and rotating means for turning the auger to withdraw the crosscut sample from the bottom of the pelican.

4,587,859

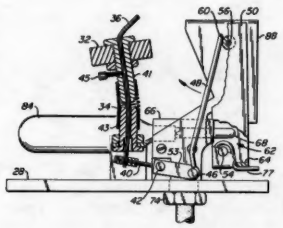
SEISMIC TRIGGER

Graham E. Coombes, 1201 St. Joseph Ave., Los Altos, Calif. 94022, and Austin J. Lemoine, 1020 Guinda St., Palo Alto, Calif. 94301

Division of Ser. No. 570,575, Jan. 13, 1984, Pat. No. 4,531,533. This application Mar. 18, 1985, Ser. No. 713,057

Int. Cl.[4] F16K *17/36*

U.S. Cl. 74—2 **5 Claims**



1. An apparatus responsive to inertial forces from a reference means for releasing an escapement comprising:

a weight;

a coil extension spring attached to said weight;

means for mounting said spring to said reference means such that said weight rests upon said spring, and said weight being movable in at least all directions in a plane transverse of the axis of said spring;

cable means attached to said weight, said cable means being reciprocally movable in response to at least non-axial oscillatory movement of said weight; and

escapement means, said escapement means comprising first lever means attached to said cable means, said first lever means being mounted on a pivot, catch means, said catch means comprising a first stop means, and a second lever means, said second lever means being operative to rest against said stop means in a first position, said first lever means being movable between said first position and a second position, wherein said second position releases for movement said second lever arm from said first stop means;

wherein the distance between said mounting means and said weight is adjustable and wherein the length of said spring means is adjustable for adjusting resonant response frequency of said weight and spring to respond to oscillatory inertial movement in a selected predefined frequency range.

4,587,860

GYROSCOPE APPARATUS, IN PARTICULAR A FLEXIBLY SUSPENDED AND ELECTROSTATICALLY SUPPORTED GYRO ACCELEROMETER

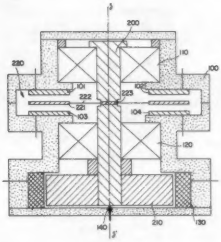
Jean-Thierry Audren, Les Ulis, France, assignor to Societe de Fabrication d'Instruments de Mesure, Paris, France

Filed Mar. 27, 1984, Ser. No. 593,765

Claims priority, application France, Apr. 1, 1983, 83 05464

Int. Cl.[4] G01C *19/28, 19/02*

U.S. Cl. 74—5 F **10 Claims**



1. A flexibly suspended gyroscope apparatus comprising a fixed body, a rotary drive shaft supported in said body, and a flywheel mounted on said drive shaft by a rotary joint, said joint serving to retain the flywheel radially and to directly transmit rotary drive thereto, while leaving said flywheel free to oscillate with two degrees of freedom about a central position in which the axis of the flywheel is aligned with the axis of the drive shaft, the improvement wherein said flywheel is also free for axial translation with one degree of freedom, wherein support means are provided for applying an axial force to the flywheel by electrostatic or electromagnetic induction, and wherein axial position detector means are provided for detecting the axial position of the flywheel, said support means being servo controlled by said detector means to maintain the flywheel in a predetermined axial position.

4,587,861

INTERNAL SPEED-REDUCTION TYPE STARTER

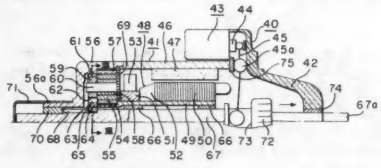
Akira Morishita, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 3, 1984, Ser. No. 627,548

Claims priority, application Japan, Jul. 20, 1983, 58-113823[U]

Int. Cl.[4] F02N *15/06*

U.S. Cl. 74—7 E **3 Claims**



1. An internal speed-reduction type starter which comprises:

(a) an armature placed at the inner circumferential side of a stator so as to be rotatable,

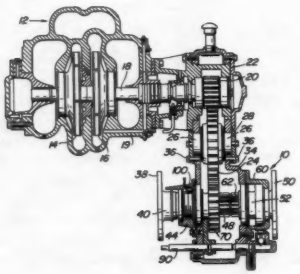
(b) an armature rotary shaft of a cylindrical form which is fitted to the revolution center part of said armature,
(c) a reduction gear device driven at a reduced speed by a gear formed at one end of said armature rotary shaft,
(d) an overrunning clutch comprising a first connecting member driven by a rotating part at the output side of said reduction gear device and a second connecting member which allows one-way connection to said first connecting member,
(e) an output rotary shaft which passes through said cylindrical armature rotary shaft in a slidable manner in its axial direction to extend from both sides of said armature rotary shaft and which is connected at its one end to said second connecting member of said overrunning clutch through a spline structure,
(f) a pinion placed at the other end of said output rotary shaft, and,
(g) an electromagnetic device for causing said pinion to move in the axial direction.

4,587,862

TRANSMISSION FOR PUMPS

Kenneth F. Hoffman, Collegeville, Pa., assignor to Hale Fire Pump Company, Conshohocken, Pa.

Filed Jul. 10, 1983, Ser. No. 513,378
Int. Cl.[4] F16H *37/00*
U.S. Cl. 74—15.88 **12 Claims**



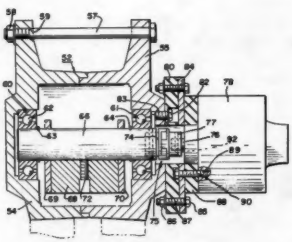
1. A pump transmission for a pump having a pump shaft and an input gear for causing rotation of said pump shaft comprising:
a housing mounted adjacent the pump input gear having first and second spaced apart wall means,
an input member rotatably mounted in said housing and including a splined shaft portion, a cylindrical shaft portion and an input flange portion,
first rolling bearing means positioned between said first housing wall means and said input member cylindrical shaft portion for rotatably supporting said input member in said housing,
an output member rotatably mounted in said housing in axial alignment with said input member and including a splined shaft portion, a cylindrical shaft portion and an output flange portion,
second rolling bearing means positioned between said second housing wall means and said output member cylindrical shaft portion for rotatably supporting said output member in said housing,
said splined portions of said input member and said output member being axially aligned and having the same tooth configuration,
said input member and said output member being rotatably mounted to rotate on an axis spaced from and adjacent to the axis of rotation of the pump input gear,
a sliding gear slidably mounted on said splined shaft portion of said input member at an internal splined portion thereof and having externally facing gear teeth,
said sliding gear being constructed and arranged to cooperate with said splined shaft portions of said input member and output member to slide between a road position wherein said internal splined portion thereof is in engagement with both the splined shaft portions of said input member and said output member and a pump position wherein said internal splined portion thereof only engages the splined shaft portion of the input member, the gear teeth of said sliding gear engaging the gear teeth of the pump input gear in said pump position of said sliding gear,
said input flange being provided with an annular pilot surface having a plurality of circumferentially spaced holes therein for use in attaching the input flange to a first transmission means and a second pilot surface internally of said first pilot surface and having a second series of holes formed therein for use in attaching said input flange to a second transmission means.

4,587,863

VIBRATION DAMPENING APPARATUS FOR MOTOR ACTUATED ECCENTRIC FORCES

Theodore S. Wadensten, P.O. Box 8, Stilson Rd., Wyoming, R.I. 02898

Continuation of Ser. No. 418,404, Sep. 15, 1982, which is a continuation-in-part of Ser. No. 196,310, Oct. 14, 1980, abandoned. This application May 29, 1984, Ser. No. 614,658
Int. Cl.[4] F16H *33/10*
U.S. Cl. 74—87 **3 Claims**



1. A vibration damping apparatus for mechanism, said apparatus having at least one eccentric weight is carried on and by a rotating shaft isolated from transmitting vibrations to a motor rotating said shaft, the damping apparatus including:
(a) an independent housing having a cavity within which at least one eccentric weight is adapted to be moved in a rotational orbit;
(b) a support shaft rotatably carried within and by said independent housing;
(c) at least one eccentric weight secured to said support shaft and rotated as the support shaft is rotated;
(d) at least one anti-friction bearing carried in a precision bore portion of the independent housing, said anti-friction bearing in a mounted condition in said independent housing carrying said support shaft and secured eccentric weight or weights so that the forces of vibration created in the rotated support shaft are transmitted to the independent housing, said bearing having a capability for accommodating said forces of vibration;
(e) a motor including a rotor and housing and for operational use positioned adjacent the independent housing;
(f) a coupling half mounted and secured to that end of the support shaft nearest the motor rotor;
(g) a resilient central portion in a mounted condition adapted to transmit torque as developed by said motor to the support shaft, with said resilient central portion substantially eliminating a transmission of vibration forces from said rotated shaft;

(h) a second coupling half mounted on and secured to an output shaft of said motor, said coupling half adapted to engage said resilient central portion of the coupling, with the resilient central portion providing damping of vibrations from the rotation of the eccentric weight and substantially eliminating a transmittal of said forces from the support shaft to the motor shaft, said first coupling half, said resilient central portion and said second coupling half when assembled providing rotational alignment of said support shaft and motor rotor, and

(i) a resilient ring-like member interposed between the motor housing and independent housing, said resilient ring-like member attached to the motor housing with a first arrangement of securing means as by bolts or cap screws and with said resilient ring-like member also secured to the independent housing by a second arrangement of securing means as by bolts or cap screws, said first and second arrangement of securing means independent of each other and the resilient ring-like member and in secured position providing a desired alignment and positioning of the support shaft and motor rotor, said interposed resilient ring-like member providing a damping of the vibration forces from transmittal from the independent housing to the motor housing and at this same time period the resilient coupling central portion damps transmittal of said vibration forces from the support shaft to the motor rotor, this damping of said vibration forces as developed within the independent housing to the secured and positioned motor, drastically reducing transmittal of said vibration forces so that excessive loads are not imposed on the motor rotor bearings carrying the rotor and thus preventing shortened life and a failure of said motor rotor bearings.

4,587,864

HANDLE HEIGHT ADJUSTING MECHANISM FOR A BABY CARRIAGE

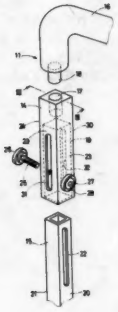
Kenzou Kassai, Osaka, Japan, assignor to Aprica Kassai Kabushikikaisha, Osaka, Japan

Filed Oct. 11, 1984, Ser. No. 659,667

Claims priority, application Japan, Nov. 4, 1983, 58-171761[U]

Int. Cl.⁴ B62K *21/16*; F16B *7/10*; B62B *7/12*

U.S. Cl. 74—551.3 **1 Claim**



1. A mechanism for adjusting the height of a handle, especially in a baby carriage, comprising handle means including an upper rod portion (14) having a grip (16), and a lower rod portion (15) slidably supporting said upper rod portion (14); either said upper rod portion (14) or said lower rod portion (15) forming a sleeve defining an opening, while the other rod portion forms an insert adapted to be received in said opening in said sleeve; said insert comprising a vertically extending throughgoing elongated opening (22); pin means (25) extending through said elongated opening (22) in said insert, said pin means having opposite pin ends projecting out of said sleeve; one pin end of said pin means (25) having a knob (26) fixed to said one pin end, said knob being positioned in contact with an outer surface of said sleeve, while the other pin end comprises an external threading which is adapted to engage with an internal thread positioned on an outer surface of said sleeve; and elongated hole means (31, 32) extending substantially longitudinally in said sleeve in such a position that flexing of said sleeve in response to tightening of said pin means is facilitated for locking said rod portions relative to each other.

4,587,865

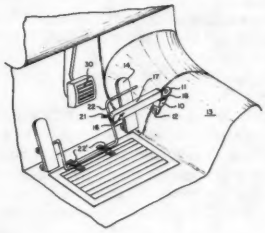
GAS FEED SAFETY DEVICE FOR AMPUTEES

Ralph Winner, 2242 King Ridge Rd., Pittsburgh, Pa. 15237

Filed Dec. 8, 1980, Ser. No. 214,468

Int. Cl.⁴ G05G *1/16*

U.S. Cl. 74—562.5 **5 Claims**



1. A gas feed safety device for right leg amputees for use in conjunction with a left foot accelerator device coupled to a normal accelerator pedal comprising a socket member adapted to be attached to the floor or hump of an automobile on one side of an accelerator pedal and an elongte foot stop member having a depending arm at one end adapted removably to fit in said socket member to hold the foot stop member spaced above said normal accelerator pedal with the other end of said foot stop member extending beyond the other side of said accelerator pedal and to hold the same member rigidly in place, whereby the normal accelerator pedal is protected against contact by an artificial leg.

4,587,866

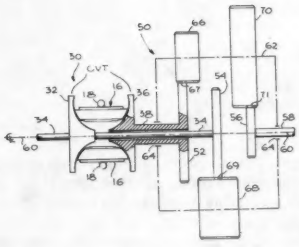
CONSTANT SPEED DRIVE SYSTEM AND PLANETARY GEAR DRIVE THEREFOR

James H. Kraus, Huntington Beach, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Sep. 21, 1981, Ser. No. 303,950

Int. Cl.⁴ F16H *37/06, 15/08, 3/74, 1/28*

U.S. Cl. 74—691 **32 Claims**



1. A constant speed drive system for providing power to an output shaft at substantially constant speed from an input shaft operable at variable speed over a predetermined range comprising:

a continuously variable transmission having an input shaft rotatable at variable speeds within a predetermined range and capable of splitting input power into two distinct power paths, a first path transmitting power along a first shaft rotatable at variable speed with said input shaft, the second power path including a second shaft which is concentrically mounted surrounding said first shaft and is rotatable at a speed which is variable with respect to the input shaft in accordance with the setting of the continuously variable transmission, and means for varying the speed ratio between the input shaft and said second shaft, said second shaft being driven to rotate in a direction opposite to the rotation of the first shaft;

a dual input planetary gear drive having an output shaft, a planetary gear carrier having first and second planet gear sets engaging first and second sun gears which are secured to the first and second shafts of the continuously variable transmission, and a third sun gear secured to said output shaft and engaging a third planet gear set secured to the gear carrier to drive the output shaft from said first and second shafts;

means for monitoring the rotational speed of the output shaft; and

means responsive to said monitoring means and coupled to the continuously variable transmission to vary the speed ratio thereof so as to compensate for changes in speed of the input shaft and thereby maintain the speed of the output shaft substantially constant at a preselected value.

4,587,867

CONTROL MECHANISM FOR A MACHINE FOR WORKING ON SAWS

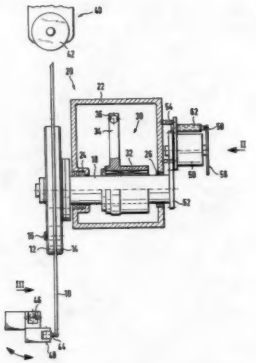
Erich Pokorny, and Norbert Bailer, both of Schemmerhofen, Fed. Rep. of Germany, assignors to Vollmer Werke Maschinenfabrik GmbH, Riss, Fed. Rep. of Germany

Filed Apr. 20, 1984, Ser. No. 602,517

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1983, 3314601

Int. Cl.⁴ B23D *63/08*

U.S. Cl. 76—25 R **14 Claims**



1. A control mechanism for working on saws; in particular, a sharpening machine for saws, comprising:

means for advancing a saw blade stepwise through one or more tooth spacings of the saw blade;

machining means for carrying out at least one working stroke on a saw blade tooth when said advancing means has completed an advance of the saw blade;

a spacing gage connected to said bade blade and being advanced therewith by said mean for advancing;

signal means operatively associated with said spacing gage for emitting signals in the form of pulses in response to the advance of the saw blade; and

a control circuit means for inhibiting a working stroke of said machining means when the intended advance of the saw blade has not occurred and for permitting a working stroke when an intended advance has occurred.

4,587,868

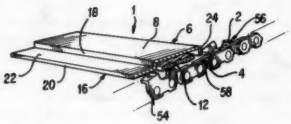
FILING DEVICE FOR CHAIN SAW CHAIN DEPTH GAUGES

Daniel Kuwica, 1756 Shannon Ct., Coquitlam, British Columbia, Canada V3J 6C6

Filed Aug. 23, 1985, Ser. No. 768,723

Int. Cl.⁴ B23D *63/16*

U.S. Cl. 76—36 **11 Claims**



1. A device for controlling filing of a depth gauge of a chain saw chain, having a plurality of cutter links spaced-apart by non-cutter links, each cutter link having a depth gauge, a top cutter edge and a back, the device comprising:

an elongated file holder having a center portion with means for holding a file, a flat surface along a first side of the center portion, and a straight edge along a second side of the center portion, the flat surface and the straight edge facing outwardly in one common direction with a filing surface of a file held in the center portion, the flat surface and the straight edge being positioned relative to the center portion such that, after a depth gauge of a first cutter link has been filed to a desired level, the flat surface rests against the cutter edge of the first cutter link while the straight edge engages a non-cutter link and the back of a second cutter link which is adjacent the first cutter link.

4,587,869

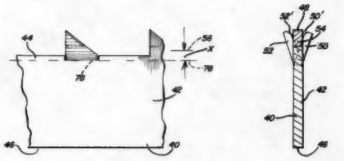
METHOD AND APPARATUS FOR RECONDITIONING BAND SAW BLADE

Gerald D. Hamer, R.D. 5, Box 303 C, Lewistown, Pa. 17044

Filed Jun. 20, 1985, Ser. No. 746,873

Int. Cl.⁴ B23D *63/04*

U.S. Cl. 76—58 **9 Claims**



1. In combination with a saw blade having an elongated cutting edge outwardly from which longitudinally spaced teeth project and wherein each tooth may include a hardened outer tip end and a root end integral with said blade and said blade includes teeth of opposite right and left hand sets spaced along said cutting edge, a blade reconditioning unit including a support, tooth reset die means mounted from said support in predetermined location thereon, said support including support means mounting said blade therefrom for intermittent guided shifting relative thereto to bring successive teeth spaced along said cutting edge into predetermined indexed position relative to said location, said teeth of opposite set

being bent intermediate of said tip ends and said base ends in order to form the set thereof, said die means including means operative to engage and bend said teeth of opposite set back and past neutral set positions and to the reverse set positions with the bend areas of the reverse set teeth being formed in the longitudinal marginal portion of said blade defining said cutting edge inwardly of the base ends of said teeth.

4,587,870

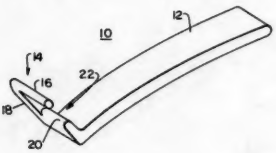
SKI BOOT BUCKLE TOOL

Kenneth Colburn, Box 184, R.R. 1, W. Main St. W. Cummington, Mass. 02148

Filed Nov. 8, 1984, Ser. No. 669,816

Int. Cl.[4] A63C *11/00*

U.S. Cl. 81—15.9 **1 Claim**



1. An improved tool for use in closing and opening a boot buckle assembly, said buckle assembly consisting of a pivotably mounted clamping member secured to one flap of an opening in a boot and a second member secured to the opposite flap of said opening in said boot, said second member being adjustably engagable with said clamping member, the improvement which comprises a handle member and an engagement member affixed to said handle member at an angle of about 75°, said engagement member comprising a pin mounted on an off-center arm and a heel member aligned with said pin and spaced from said pin to provide an opening which loosely receives said clamping member at any desired point along its length, said tool gripping said clamping member between said pin and said heel member as said handle of said tool is moved a few degrees in the desired direction to close or open said buckle assembly.

4,587,871

NC TURRET LATHE

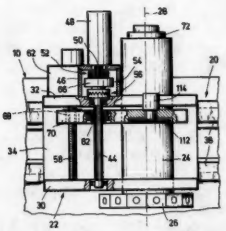
Heinrich Lahm, Neuhausen, Fed. Rep. of Germany, assignor to Index-Werke KG Hahn & Tessky, Esslingen, Fed. Rep. of Germany

Filed Aug. 2, 1983, Ser. No. 519,627

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1982, 3231782

Int. Cl.[4] B23B *29/32*

U.S. Cl. 82—2 R **8 Claims**



1. An NC turret lathe comprising a frame; a spindle rotatably mounted on said frame; means on said spindle for holding a workpiece; a slide slidably guided on said frame along a path of movement; a tool turret mounted on said slide for rotation about an indexing axis; drive means operatively connected to said slide; control means constantly coupled with said drive means for monitoring said drive means; first connecting means constantly interconnecting said drive means and said slide whereby said drive means moves said slide along said path of movement; second connecting means interconnecting said drive means and said turret whereby said turret is rotated about said indexing axis by said drive means; said second connecting means including a drive coupling movable between engaged and disengaged positions whereby said drive means is operatively connected to rotate said turret only when said drive coupling is in its engaged position; said drive means remaining in operative connection with said first connecting means and slide regardless of the position of said drive coupling.

4,587,872

METHOD AND APPARATUS FOR PRODUCING V-BELTS

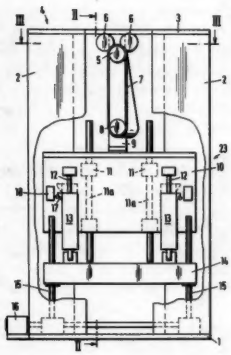
Horst Müller-Erwig, Neustadt, Fed. Rep. of Germany, assignor to Hermann Berstorff Maschinenbau GmbH, Fed. Rep. of Germany

Filed Apr. 11, 1985, Ser. No. 721,944

Claims priority, application Fed. Rep. of Germany, Apr. 18, 1984, 3414674

Int. Cl.[4] B26D *7/14*

U.S. Cl. 83—18 **18 Claims**



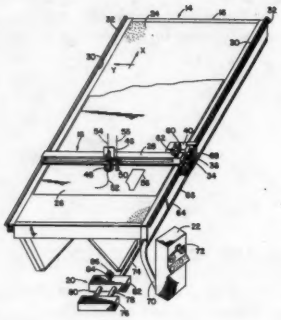
1. A method of producing open-sided V-belts by cutting from a vulcanised sleeve-shaped roll comprising the steps of disposing said vulcanised roll around first and second roller means, tensioning said roll by the application of a tensioning force thereto, said tensioning force being applied by tensioning means, said tensioning means comprising means operatively connected to said second roller means whereby the weight of said tensioning means acts on said second roller to tend to cause said second roller means to move away from said first roller means thereby tensioning said vulcanised roll and, when a predetermined tensioning force limit is attained, partially counteracting said weight of said tensioning means by applying a force in a direction opposed to said tensioning force so as to resist movement of said second roller away from said first roller, cutting a V-belt from said roll whilst said roll is tensioned, removing said cut-belt and increasing said counteracting force in dependence upon the number of said V-belts cut and removed from said roll.

4,587,873

APPARATUS WITH BELT VALVE VACUUM SYSTEM FOR WORKING ON WORK MATERIAL

Heinz J. Gerber, West Hartford, Conn., assignor to Gerber Scientific, Inc., South Windsor, Conn.

Filed May 22, 1985, Ser. No. 736,838
Int. Cl.[4] B26D *1/00, 7/02*
U.S. Cl. 83—100 33 Claims



1. An apparatus for working on work material, said apparatus comprising:

a table for supporting work material and including,

a top layer of material providing a work material support surface and having air passages extending vertically therethrough and distributed over said support surface,

means located below said top layer of material for vertically supporting said top layer and forming a plurality of compartments each having a top communicating with the air passages of that portion of said top layer overlying said compartment,

means providing an air plenum,

an elongated rigid air valving member having a valving face extending along its length,

means defining a plurality of first ports and a plurality of second ports in said valving face, said valving face having a plurality of successive areas arranged in a row along its length with there being at least one of said first ports and at least one of said second ports located in each of said areas,

means providing communication between said at least one first port of each of said areas and said air plenum,

means providing communication between said at least one second port of each of said areas and said air plenum,

a belt deflector unit movable along the length of said valving face,

an air valving belt extending along the length of said valving face and cooperating with said belt deflector unit,

means positioning the longitudinal portion of said belt located on either side of said deflector unit closely adjacent to said valving face,

said belt deflector unit having means for deflecting said belt away from and holding it in spaced relation to said valving face at the location of said deflector unit to provide free communication between those first ports and those second ports located adjacent said deflector unit, and

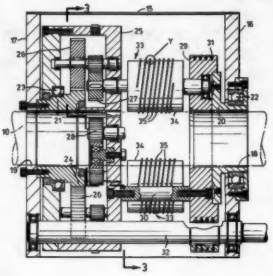
means for moving said belt deflector unit along the length of said valving face to vary the selection of which of said first and second ports are brought into communication with one another by said deflector unit.

4,587,874

ROTARY PUNCH

Manfred A. A. Lupke, 10 McLeary Ct., Concord, Ontario, L4K 2Z3, Canada, and Gerd P. H. Lupke, 597 Woodland Acres Ct., Maple, Ontario, Canada L0J 1E0

Continuation-in-part of Ser. No. 335,171, Dec. 28, 1981, abandoned. This application Jan. 19, 1984, Ser. No. 572,119
Int. Cl.[4] B23D *25/00;* B26D *3/00, 5/20;* B23C *3/00*
U.S. Cl. 83—340 9 Claims



1. In a pipe perforating apparatus of the type comprising a spindle having an axis of rotation and a substantially cylindrical base surface concentric with the axis, a cutting tool mounted on the spindle and projecting from the base surface, and drive means for rotating the spindle about its axis of rotation and simultaneously revolving the spindle about the pipe whereby the cutting tool periodically engages and perforates the pipe, the improvement wherein:

the cutting tool is a punch with a piercing end adapted to punch an aperture in the pipe, substantially radially thereof;

the punch is mounted on the spindle with the piercing end facing radially away from the spindle axis and spaced from the base surface a distance only slightly greater than the thickness of a pipe to be perforated;

the drive means is constructed to rotate the spindle about its axis and revolve the spindle about the pipe while maintaining the relationship;

$$W1/W2=A/B$$

where

W1 is the angular speed of rotation of the spindle about its axis,

W2 is the angular speed of revolution of the spindle about the pipe,

A is the outside radius of the pipe where it contacts the base surface of the spindle and

B is the radius of the base surface of the spindle; whereby each point on the base surface of the spindle travels about the pipe in an epicycloid and the punch is driven into and drawn out of the pipe substantially radially, substantially without tangential movement relative to the pipe.

4,587,875

PORTABLE SAWING DEVICE UTILIZING A CIRCULAR POWER SAW

Theodore Deley, 2039 Austin Ave., Coquitlam, British Columbia, Canada V3K 3R5

Filed May 2, 1985, Ser. No. 729,746
Int. Cl.[4] B27B *5/20*
U.S. Cl. 83—471.3 10 Claims

1. A portable sawing device which utilizes a circular power saw and which is adapted to be detachably secured to a workpiece support bench constructed of wood and consisting of an extended, flat, broad, horizontal section defining a workpiece

support surface, and a similarly extended, narrow, flange section secured along the rearward edge thereof, defining a workpiece abutting or rip fence, said portable sawing device comprising:

a frame comprising a plurality of frame members;

frame attaching means for detachably securing the frame against the underside of the workpiece support bench;

a saw supporting arm, cantilvered forwardly and horizontally over the workpiece support bench from a vertical support column upwardly disposed behind the bench;

a saw support member for supporting a power saw thereon;

means for engaging a power saw on the saw support member;

means for securing a power saw to the saw support member;

pivotal attaching means, for attaching the saw support member to a bearing means at the forward part of the saw supporting arm, permitting the pivotal movement of the saw support member with a power saw thereon about a substantially horizontal axis between a fully lowered cutting position generally spaced from and parallel to the workpiece support surface and a raised, non-cutting, tilted-up position above the workpiece support surface to allow placement, positioning, and removal of a workpiece;

means for upwardly biasing the saw support member with a power saw thereon to the raised, non-cutting position;

slidable carriage means carrying the vertical support column and slidably mounted below the frame by means permitting horizontal back and forth movement whereby a power saw supported on the saw support member may be reciprocated in conjunction with the saw supporting arm to traverse a workpiece supported on the workpiece support bench to effect a cut on the workpiece;

means for adjustably and rigidly securing the vertical support column to the slidable carriage means permitting upward and downward adjustment of the support column;

carriage mounting means slidably receiving the carriage means and pivotally attached to the underside of the frame permitting the horizontal rotational movement of the carriage means about a vertical axis whereby the saw supporting arm may be aligned at various lateral cutting angles to the longitudinal axis of the workpiece support bench and, by means provided, locked in fixed relation to the frame at desired lateral cutting angles;

means for determining desired lateral cutting angles;

means for quickly locating selected lateral cutting angles;

means for releasably locking the slidable carriage means in fixed relation to the carriage mounting means;

bearing means, attached to the forward part of the saw supporting arm and bearing the pivotal attaching means of the saw support member, permitting the rotational movement of the attached saw support member and a power saw thereon about a vertical axis from a lateral cutting position parallel to the longitudinal axis of the saw supporting arm to a rip cutting position perpendicular to the longitudinal axis of the saw supporting arm;

means for restraining the saw support member and a power saw thereon in the fully lowered cutting position when in the rip cutting position;

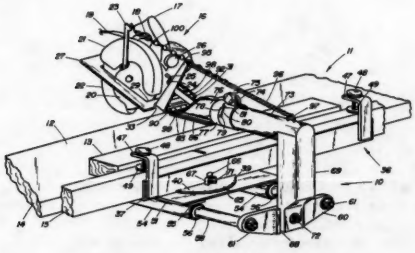
means for releasably locking the bearing means in fixed relation to the saw supporting arm when in the lateral cutting position and when in the rip cutting position;

means for permitting the rotation of the bearing means about a horizontal axis parallel to the longitudinal axis of the saw supporting arm whereby the horizontal pivotal axis of the pivotal attaching means of the saw support member may be rotated from the horizontal position and the plane of the saw blade tilted from a vertical cutting position to bevel angle cutting positions;

means for determining desired bevel cutting angles;

means for releasably locking the bearing means at the vertical and rotated bevel angle cutting positions; and

means for limiting the extent of rotation of the bearing means about the horizontal axis parallel to the longitudinal axis of the saw supporting arm.



4,587,876

SAW BLADE FOR PREPARING WOOD AND OTHER MATERIALS

Herbert Erhardt, Bergholz 134, 8531 Amlikon, Switzerland

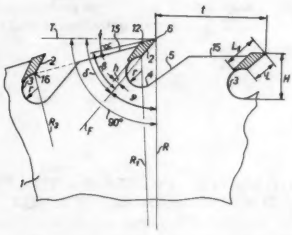
PCT No. PCT/CH84/00006, § 371 Date Sep. 11, 1984, § 102(e) Date Sep. 11, 1984, PCT Pub. No. WO84/02676, PCT Pub. Date Jul. 19, 1984

PCT Filed Jan. 12, 1984, Ser. No. 653,224

Claims priority, application Switzerland, Jan. 13, 1983, 168/83

Int. Cl.⁴ B27B *33/08, 33/12*

U.S. Cl. 83—839 **13 Claims**



1. A circular saw blade, particularly for cutting wood and the like material, having teeth,

each teeth including a hard metal insert (12), forming the cutting edge and secured to a tooth body,

the insert being characterized in that:

the face (2) of the insert (12) has an angle of intersection (δ) of less than 60° but at least 40°, with respect to a tangent (T) to said cutting edge (6);

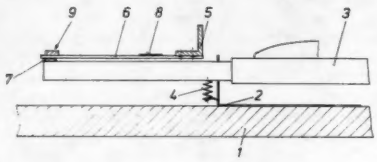
the insert (12) is substantially in form of a parallelogram, with two long parallel straight sides and two short sides, the short side opposite to said cutting edge being formed with a concave, curved portion;

and wherein the teeth are formed with a curved section (3) adjoining the concave curved portion of the insert, and continuing smoothly into the base (4) or root between the teeth.

4,587,877
KEY BOARD SYSTEM FOR AN ELECTRONIC MUSICAL INSTRUMENT

Ernst Zacharias, Trossingen, Fed. Rep. of Germany, assignor to Matth Hohner AG, Trossingen, Fed. Rep. of Germany

Filed Nov. 20, 1984, Ser. No. 673,326
Claims priority, application Fed. Rep. of Germany, Nov. 25, 1983, 3342558
Int. Cl.[4] G01H *1/00*; G10C *3/12*
U.S. Cl. 84—1.1 **11 Claims**



1. Apparatus for generating electrical input signals for an electronic musical instrument comprising:

key means, said key means including an elongated member supported intermediate its length for pivotal motion;

means for resiliently biasing said key means elongated member to a rest position;

a leaf spring, said spring having first and second oppositely disposed ends;

means supporting said leaf spring so that at least a portion thereof is adjacent a portion of said key means elongated member, said support means engaging said leaf spring adjacent the first end thereof, actuation of said key means causing said elongated member to pivot from said rest position whereby said portion of said elonaged member will move toward said leaf spring portion and a deflection force will be imparted to said leaf spring;

a piezoelectric element mounted on said leaf spring, said piezoelectric element being deformed by deflection of said leaf spring and producing an electrical output signal upon deformation; and

a mass mounted on said leaf spring, said mass being dimensioned to be accelerated whereby a deflection force imparted to said leaf spring upon actuation of said key means will be amplified.

4,587,878
AUTOMATIC PERFORMING APPARATUS AND DATA RECORDING MEDIUM THEREFOR

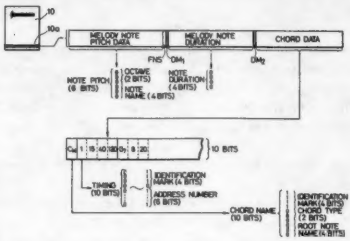
Akira Nakada; Takatoshi Okumura, and Kotaro Mizuno, all of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Continuation of Ser. No. 390,793, Jun. 21, 1982, abandoned. This application Jul. 6, 1984, Ser. No. 626,610
Claims priority, application Japan, Jun. 27, 1981, 56-100000; Jun. 27, 1981, 56-99999
Int. Cl.[4] G10F *5/00*; G10G *3/04*; G10H *1/38, 1/42*
U.S. Cl. 84—1.03 **26 Claims**

20. A recording medium for use with an automatic music performing apparatus, said recording medium comprising:

an elongated recording medium strip, there being situated on said strip;

a plurality of contiguous zones along said medium strip, each of said zones having a first region containing machine readable indicia in the form of chord name data specifying the name of a chord, and a set of adjacent second regions each containing machine readable indicia in the form of timing data specifying a respective one of one or more occurrence timings in a musical performance of a chord having the chord name specified in said first region,

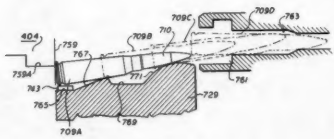


said contiguous zones being spaced along said medium for sequential machine readability.

4,587,879
WEAPON CARTRIDGE FEEDER APPARATUS AND METHOD

Giulio V. Savioli, Andover, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 18, 1983, Ser. No. 553,204
Int. Cl.[4] F41D *10/06, 10/38*
U.S. Cl. 89—33.25 **28 Claims**



13. An automatic weapon system comprising:

a gun barrel having a breech or chamber for receiving a cartridge;

receiver means for providing the primary support frame for said weapon, said receiver means including at least first through third elongated tubular members mounted in substantially parallel relationship and a triangular pattern between inside faces of a forwardmost end cap and a rearwardmost back plate, said end cap including means for mounting said gun barrel near its breech end between said first through third tubes, said gun barrel extending from an outside face of said end cap, said first tubular member being uppermost relative to said second and third tubular members, the latter two being coplanar at substantially the same height;

elongated force-transmitting means including operating rods longitudinally movable within each of said second and third tubular members;

gas cylinder means connected between said gun barrel and said force transmitting means in each of said second and third tubular members, for applying forces generated by gases developed within said gun barrel during firing of said weapon to said force-transmitting means:

bolt carrier means slideably mounted upon said first tubular member for moving a cartridge into the breech of said barrel for firing said cartridge, said force- transmitting means being responsive to the gases generated by said firing for applying a recoil force to said bolt carrier means for moving the latter rearward; and

cartridge feeder means for feeding within a space allocated for cartridges of one caliber, cartridges having calibers relatively larger than said one caliber, said feeder means being mounted upon said second and third tubes, and being responsive to recoil movement of said bolt carrier means for directly positioning said larger caliber car-

tridges from a horizontal to an angular position between a bolt lug face of said bolt carrier means and the breech or chamber of said gun barrel, said cartridge feeder means being further operative with said bolt carrier means, whereby after the recoil cycle the latter moves forward for pushing said cartridge into said chamber of said barrel preparatory to firing said cartridge.

4,587,880
HATCH FOR A COMBAT VEHICLE, ESPECIALLY AN ARMORED VEHICLE

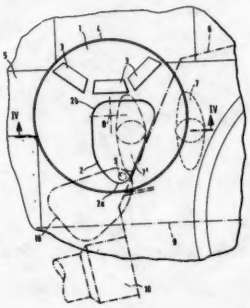
Uwe Sprafke, Schauenburg, Fed. Rep. of Germany, assignor to Wegmann & Co. GmbH, Kassel, Fed. Rep. of Germany

Filed Oct. 21, 1983, Ser. No. 544,141

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1982, 3238885

Int. Cl.[4] F41H *5/22;* **F41F** *9/04;* **B60J** *7/00;* **E05D** *15/58*

U.S. Cl. 89—36.14 **7 Claims**



1. In a combat vehicle with a rotating turret on a hull, a driver's operating position in the hull and means forming an entry-and-exit hatch in the roof of the hull in the vicinity of the driver's operating position with a cover for closing the hatch, the improvement wherein the hatch forming means comprises a circular plate in the roof of the hull and means mounting the circular plate for rotation about an axis perpendicular to the roof and wherein the hatch is disposed in the circular plate eccentric to the axis of rotation of the plate and further comprising at least one viewing device mounted on the rotatable plate for viewing from the driver's operating position and wherein the hatch and the at least one viewing device are positioned substantially opposite each other on the plate relative to the axis of rotation of the plate.

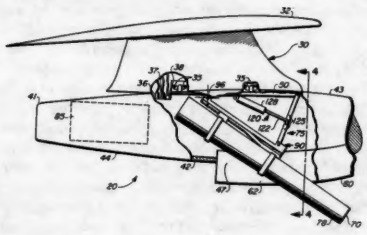
4,587,881
DEPRESSION GUN POD

Arthur E. Clayson, Inyokern; Jack Bates, and Richard D. Fulmer, both of Ridgecrest, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 11, 1984, Ser. No. 659,739

Int. Cl.[4] F41F *23/00*

U.S. Cl. 89—37.16 **7 Claims**



1. A depression gun mount for use in a gun pod having a predetermined longitudinal axis, having an attachment member, which extends along one side of the exterior of the pod and is detachably connectable to an aircraft, and having a gun, which has a breech portion disposed within the pod and a muzzle portion spaced along the pod from the breech portion, the mount comprising:

an azimuth member extending generally along the gun between said portions thereof;

an elevation member extending generally along the gun between said portions thereof;

means for connecting the gun directly to one of said members;

means connecting the elevation member to one of the other of the members for pivotal movement of the elevation member relative thereto about a depression axis extended transversely of the pod and disposed adjacent to the breech portion;

means interconnecting the elevation member and said one of the other of the members adjacently to the muzzle portion for positioning the elevation member between a first position, in which the muzzle portion is aligned in a direction along the pod with the breech portion, and a second position in which the muzzle portion is spaced substantially from the location thereof in the first position in a direction away from the attachment member;

means connecting the azimuth member to another of said members for pivotal movement of the azimuth member relative thereto about an azimuth axis extended substantially normal to the longitudinal axis and to the depression axis and disposed adjacent to the breech portion; and

means interconnecting the azimuth member and said another of the members adjacently to the muzzle portion for supporting the azimuth member from said another of the members for movement of the azimuth portion transversely of the pod at the muzzle portion.

4,587,882
PNEUMATIC RECUPERATOR MECHANISM FOR A GUN BARREL

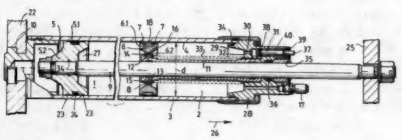
Josef Metz, Neuss, Fed. Rep. of Germany, assignor to Rheinmetall GmbH, Duesseldorf, Fed. Rep. of Germany

Filed May 10, 1984, Ser. No. 608,902

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1983, 3323713

Int. Cl.[4] F41F *19/08*

U.S. Cl. 89—43.01 **7 Claims**



1. An improved pneumatic recuperator mechanism for a weapon having a counter-recoil piston slidably mounted within a displacement and operatively connected to the gun barrel of the weapon via a piston rod, said recuperator mechanism has a self-closing valve arranged between a storage chamber and a displacement chamber disposed in said recuperator mechanism, and a throttling mechanism operatively mounted in said recuperator mechanism between said storage chamber and said displacement chamber for controlling the counter-recoil velocity and includes sealing means for preventing the escape of pneumatic pressure medium, the improvement comprising said self-closing valve is in the form of a disc, said recuperator mechanism including a cylinder the inner space of which is divided by said disc into a storage chamber and a displacement chamber, the counter-recoil piston being slidably mounted in said cylinder, said disc having at least one exchangeable low-friction guiding element mounted on its radial outer periphery which engages the inner wall of said cylinder, and said disc having a radially inner region, a sealing member

is operatively mounted in said radially inner region, a thin-walled bushing having a valve seat is coaxially fixedly mounted in said cylinder, said piston rod being slidably mounted in said bushing, whereby when said bushing abuts against the valve seat of said disc the maximum axial limit of said storage chamber is determined.

4,587,883

HIGH RESOLUTION CONTROL SYSTEM FOR A PRESSURE-RESPONSIVE POSITIONING DEVICE

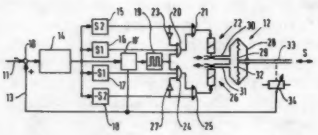
Franz-Josef Ehrentraut, Monchen-Gladbach, and Manfred Henning, Kaarst, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart and Pierburg GmbH & Co. KG, Neuss, both of, Fed. Rep. of Germany

Continuation of Ser. No. 422,382, Sep. 24, 1982, abandoned. This application Feb. 15, 1985, Ser. No. 701,799

Claims priority, application Fed. Rep. of Germany, Oct. 10, 1981, 3140301

Int. Cl.[4] F15B *9/03, 13/16*

U.S. Cl. 91—363 R **4 Claims**



1. Control system for the position of a pressure-controlled displaceable element (12) of a positioning device, said system comprising a first magnetically operable valve (22) connected between a first pressure source and said element for displacing said element in a first positioning direction and a second magnetically operable valve (26) connected between a seocnd pressure source and said element for displacing said element in a second positioning direction opposed to said first direction, means for generating an error signal ($S_{act}-S_{des}$) for directing displacement of said displaceable element towards a desired position thereof, said error signal being positive for directing displacement in said first positioning direction and negative for directing displacement in said second positioning direction, means for operating one or the other of said magnetic valves as determined by the sign of said error signal, means for producing intermittent operation of only said first magnetic valve in a first range of positive value of said error signal and for producing intermittent operation of only said second magnetic valve in a first range of negative value of said error signal corresponding in absolute magnitude to said first range of positive error signal value, and also for producing continuous operation of said first magnetic valve in a second range of positive value of said error signal and for producing continuous operation of said second magnetic valve in a second range of negative value of said error signal, said second ranges of error signal value comprising absolute magnitudes of error signal value higher than those of said first ranges of error signal value, and further comprising:

means including a variable pulse-width pulse generator and means for producing an actual increment signal representative of the absolute magnitude of displacement actually produced in response to a pulse of said generator, for automatically adjusting the ratio of operated to unoperated intervals of each of said magnetic valves during intermittent operation thereof as a function of the absolute magnitude of said error signal in a manner taking account of a predetermined base value (T_o) for the operated interval (T_v) of the valve being intermittently operated, by algebraically adding to said base value (T_o) at least one of first (T_o) and second (T_s) correction values, said first correction value, (T_o) being derived from subtractive comparison of said actual increment signal (S_{act}) with a corresponding increment (S_{des}) of desired displacement determined by said error signal, and said second correction value (T_s) being determined entirely by said error signal.

4,587,884

TANDEM BRAKE BOOSTER FOR AUTOMOTIVE VEHICLE

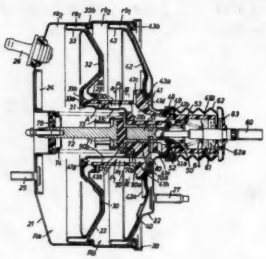
Kaoru Tsubouchi, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Feb. 1, 1985, Ser. No. 697,442

Claims priority, application Japan, Feb. 2, 1984, 59-13925[U]

Int. Cl.[4] F15B *9/10;* **F01B** *19/00*

U.S. Cl. 91—369 A **6 Claims**



1. A tandem brake booster for automotive vehicles comprising:

a housing the interior of which is subidivided into front and rear chambers by means of a partition wall member assembled therein;

front and rear movable walls respectively assembled within the front and rear chambers and arranged to be connected to each other through said partition wall member, said front movable wall subdividing the front chamber into first constant and variable pressure chambers, and said rear movable wall subdividing the rear chamber into second constant and variable pressure chambers;

a front cylindrical hub member secured at its front end to the inner peripheral portion of said front movable wall and extending from the first constant pressure chamber into the second constant pressure chamber across said partition wall member;

a rear hub member secured to the inner peripheral portion of said rear movable wall coaxially with said front cylindrical hub member and being engaged with the rear end of said front cylindrical hub member, said rear hub member being formed with a cylindrical portion which extends into the first variable pressure chamber across said partition wall member and is arranged in surrounding relationship with said front cylindrical hub member, the cylindrical portion of said rear hub member being axially slidably supported by said partition wall in an air-tight manner;

a cylindrical seal member disposed between said front cylindrical hub member and the cylindrical portion of said rear hub member, said cylindrical seal member being formed in its peripheral wall with a first recess for providing a first passage for commmunication between the first and second constant pressure chambers and with a second recess for providing a second passage for communication between the first and second variable pressure chambers; and

valve means assembled within said rear hub member for interrupting a communication of the second variable pressure chamber with the atmospheric air in a released condition of said brake booster and for establishing the communication of the second variable pressure chamber with the atmospheric air in operation of said brake booster.

4,587,885

VACUUM-OPERATED BRAKE POWER BOOSTER

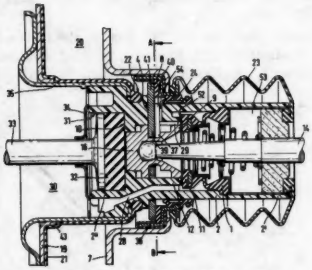
Peter Boehm, Frankfurt am Main, and Wilfried Wagner, Hattersheim, both of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Aug. 29, 1984, Ser. No. 646,240

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1983, 3332546

Int. Cl.[4] F15B *9/10*

U.S. Cl. 91—376 R 4 Claims



1. In a vacuum-operated brake power booster comprising a booster piston sealed relative to a booster housing, a piston rod adapted to be coupled to a braking pedal for the actuation of a double valve by which a working chamber of the brake power booster is connectible either to a vacuum or to a higher pressure, a first valve of said double valve being defined by a valve seat formed on a control housing associated with the booster piston and a poppet valve pre-loaded in the direction of the valve seat, and a second valve of said double valve being formed by the same poppet valve and a valve piston connected to the piston rod, the control housing being provided with an aperture through which a transverse member having a peripheral edge surface protrudes, said transverse member acting to confine the axial movability of the valve piston relative to the control housing and protruding radially from the aperture in a manner to abut a stationary stop when the power booster is in an inoperative condition, the improvement wherein a slide-guide ring clamps the control housing and is held by the booster housing, the slide-guide having a side directed towards the booster piston, and a bead made of a rubber-elastic material affixed on said side against which substantially the full peripheral edge surface of the transverse member bears when the power booster is in the inoperative condition.

4,587,886

POWER STEERING DEVICE

Naosuke Masuda, and Hirotetsu Sonoda, both of Saitama, Japan, assignors to Jidosha Kiki Co., Ltd., Tokyo, Japan

Filed Mar. 30, 1984, Ser. No. 595,122

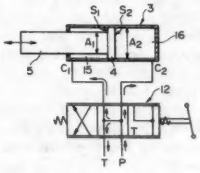
Claims priority, application Japan, Apr. 28, 1983, 58-73840; Jun. 8, 1983, 58-86380[U]

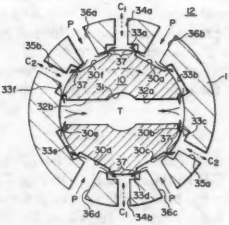
Int. Cl.[4] F15B *15/17*

U.S. Cl. 91—415 3 Claims

1. In a power steering device provided with a fluid pressure cylinder of the single rod type in which a rod-side chamber and a head-side chamber of said cylinder have different pressure receiving areas on a piston slidably fitted in said cylinder, the improvement comprising: a control valve for controlling the changeover of a flow path among a pump, a tank and said chambers in accordance with movement of a steering wheel, said control valve comprising means for connecting said rod-side chamber to said pump and said tank to said head-side chamber when piston is to be moved toward said head-side chamber, and connecting said pump to both said head-side chamber and said rod-side chamber when said piston is to be moved toward said rod-side chamber;

wherein said control valve comprises a rotor and a sleeve, each of said rotor and said sleeve being provided with six grooves formed in an outer periphery of said rotor and in an inner periphery of said sleeve at equidistantly spaced positions, said sleeve having a first pair of supply ports connected to said rod-side chamber and opening into a first pair of opposed ones of said grooves formed in said sleeve, a second pair of supply ports connected to said





head-side chamber and opening into a second pair of opposed ones of said grooves formed in said sleeve, and four hydraulic fluid inlet ports formed between respective ones of said supply ports and opening opposite respective grooves formed in said rotor, and said rotor having a longitudinally extending return path communicating with said tank and a pair of opposed hydraulic fluid discharge ports extending between said return path and a respective pair of said grooves formed in said rotor other than said grooves opposite said inlet ports.

4,587,887

SHIFT VALVE FOR AUTOMATIC TRANSMISSION

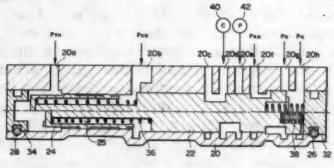
Takashi Shibayama, Chigasaki, and Kazuhiko Sugano, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Sep. 28, 1984, Ser. No. 655,677

Claims priority, application Japan, Oct. 7, 1983, 58-187088

Int. Cl.[4] F15B *13/042*

U.S. Cl. 91—469 6 Claims



1. In an automatic transmission:

a fluid operated friction device;

a source of servo actuating pressure;

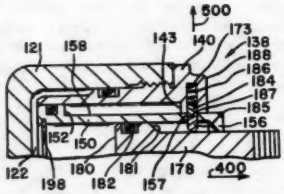
a source of governor pressure;
a source of throttle representative pressure;
a shift valve comprising
a valve body formed with a valve bore, an inlet port communicating with said source of servo actuating pressure, an outlet port communicating with said fluid operated friction device, and a drain port;
a spool slidably fit in said valve bore, said spool being movable between a first position where said outlet port is allowed to communicate with said inlet port only, and a second position where said outlet port is allowed to communicate with said drain port only;
a plug slidably fit in said valve bore;
a first spring arranged between said spool and said plug;
said valve body being formed also with a first signal pressure port communicating with said source of governor pressure, and a second signal pressure port communicating with said source of throttle representative pressure;
said spool being formed with a pressure acting area which is always subject to pressure at said first signal pressure port and urged in such a first direction as to compress said first spring in response to the pressure which said pressure acting area is subject to;
said end plug being formed with a pressure acting area which is always subject to pressure at said second signal pressure port and urged in such a second direction as to compress said first spring in response to the pressure which said pressure acting area thereof is subject to; and
a second spring so arranged as to act on said spool to urge said spool in said first direction said second spring being set weaker than said first spring.

4,587,888

EXTENSIBLE PISTON WITH BREAKABLE OR DISPLACEABLE COUPLER

Bruce W. Anderson, Niles, Mich., and Warren D. Chambers, South Bend, Ind., assignors to Allied Corporation, Morristown, N.J.

Division of Ser. No. 578,711, Feb. 9, 1984, abandoned. This application Jun. 6, 1985, Ser. No. 741,932
Int. Cl.[4] F15B *15/24*
U.S. Cl. 92—13.6 **4 Claims**



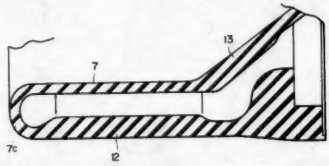
1. Fluid pressure actuated piston means and extensible cylinder means therefor comprising a casing having a cavity therein and the casing having a circumferential opening at an open end of said cavity, radially displaceable stop means and resilient means disposed in said circumferential opening with the resilient means biasing radially inwardly said radially displaceable stop means, cylinder means slidably disposed in said cavity and responsive to pressurized fluid supplied to said cavity, the cylinder means including aperture means disposed adjacent an end thereof and including abutment means disposed at each end thereof, the stop means extending into the aperture means, a piston slidably contained by said cylinder means and responsive to said pressurized fluid, the piston means including engagement means for displacing radially outwardly said displaceable stop means, the pressurized fluid supplied to said cavity acting upon said piston to move said piston relative to said cylinder means and casing, the cylinder means being prevented from extending outwardly relative to said casing by the radially displaceable stop means which extends within said aperture means of the cylinder means, said supply of pressurized fluid displacing the piston so that the engagement means of said piston displaces the stop means radially outwardly until said displaceable stop means exits said aperture means to release said cylinder means for axial movement by the pressurized fluid and thereby allow further movement of said piston relative to said casing.

4,587,889

POWER-SERVO BOOSTER

Junichi Ohki; Yuzoh Gotoh, and Takanao Kamei, all of Higashimatsuyama Japan, assignors to Jidosha Kiki Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 337,913, Jan. 8, 1982, abandoned. This application Apr. 13, 1984, Ser. No. 600,202
Claims priority, application Japan, Jan. 28, 1981, 56-10454[U]
Int. Cl.[4] F01B *19/00*
U.S. Cl. 92—98 D **6 Claims**



1. In a power servo booster including a shell, a power piston reciprocally movable within the shell, a diaphragm having an inner surface secured to the power piston and an outer surface secured to the shell, said diaphragm dividing an interior of said shell into a negative pressure chamber and an atmospheric pressure chamber, and said diaphragm, during the non-operating state of said power piston, providing a thin folded portion extending from the outer peripheral end of said power piston toward the front portion of said shell and a contact portion continuous from said folded portion and contacting an inner surface of said shell, the improvement comprising: a thickened wall portion of increased thickness formed by a discontinuous increase in thickness relative to the thickness of the thin folded portion, and said thickened wall portion does not fold or bend and is provided at least at said contact portion and extending from a point adjacent to said thin folded portion to an outer end bead portion, and a portion of the diaphragm contacts said outer peripheral end of said power piston.

4,587,890

AIR FILTRATION SYSTEM FOR HARVESTER OPERATOR CAB

Joseph C. Hurlburt, Lancaster, Pa., assignor to Sperry Corporation, New Holland, Pa.

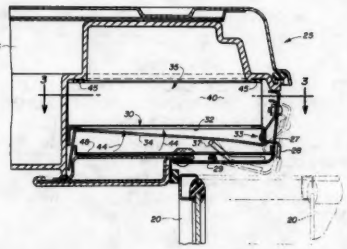
Filed Apr. 15, 1985, Ser. No. 723,424
Int. Cl.[4] B60H *3/06*
U.S. Cl. 98—2.11 **15 Claims**

1. In an operator's cab for a crop harvesting machine having a floor member supporting an operator's station; a roof member vertically spaced above said floor member; an enclosure positioned around the periphery of said floor and roof members and extending therebetween to enclose said operator's station, said enclosure including support posts for supporting said roof member above said floor member, said enclosure also including an access door pivotally mounted to one of said support posts for movement between a closed position and an opened position to permit access to and from said operator's station; air inlet means incorporated into said roof member to permit the introduction of air within said enclosure to said operator's station when said access door is in said closed position; and air filtration means supported by said roof member in operative engagement with said air inlet means to filter air entering said enclosure to said operator's station through said

air inlet means, said air filtration means including a removable filter cartridge, an improved air filtration means comprising:

a service door hingedly supported by said roof member above said access door, said service door including a latch member;

a latch engagement member engageable with said filter cartridge and said latch member, said latch engagement



member being movable when not engaged by said filter cartridge; and

lift means associated with said service door and positionably engageable with said latch engagement member when said service door is moved into a closed position to move said latch engagement member out of an engageable position with said latch member when said filter cartridge is not engaged with said latch engagement member.

4,587,891

VENTILATING DEVICE AND METHOD FOR MAKING THE SAME

Wilbur F. Kruse, 1641 Womer Dr., Wichita, Kans. 67203

Filed May 6, 1985, Ser. No. 730,429

Int. Cl.[4] F24F *7/00*

U.S. Cl. 98—29 **7 Claims**

1. A venting device for ventilating new masonry, stone, precast veneer, or the like, comprising a conduit means having an elongated body with a body wall and a first open end and a second open end, said first open end having a circumferential structure defining an inward flange means with an inward flange edge that defines the meeting point of the inward flange means and the inside surface of the body wall and said second open end having a circumferential structure defining a bevel;

a generally cylindrical cup-shaped screen means having a screen bottom with a circumferential screen edge and an essentially cylindrical screen wall integrally bound to the screen bottom at the circumferential screen edge;

and said cup-shaped screen means is slidably disposed through the beveled second open end and the elongated body of the conduit such that said screen bottom is substantially parallel with said inward flange means and the circumferential screen edge essentially registers with the inward flange edge and a portion of the screen bottom flushes against the inward flange means.

4,587,892

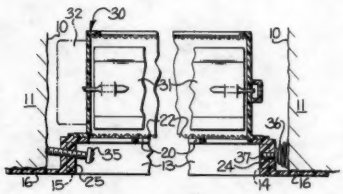
FOUNDATION VENTILATOR

Alvin E. Witten, and Erik H. Witten, both of Gastonia, N.C., assignors to Witten Automatic Vent Company, Inc., Gastonia, N.C.

Filed Jul. 8, 1985, Ser. No. 752,843

Int. Cl.[4] F24F *7/00*

U.S. Cl. 98—29 **7 Claims**



1. A foundation ventilator including quick and simple means for installing and maintaining the same in a rectangular opening of predetermined width and height in a wall from the exterior side of the wall, said ventilator comprising a molded plastic mounting frame including interconnected horizontal top and bottom walls and vertical side walls defining a rectangular support frame of predetermined width and height of a lesser dimension than said predetermined width and height dimension of said wall opening, a peripheral flange extending outwardly from the front portions of said top, bottom and side walls and adapted to engage the exterior face of the wall surrounding said wall opening to limit inward movement of said support frame into said wall opening and to cover any space between the outer surfaces of said support frame and the interior surface of said wall opening, a grill extending across the interior of said top, bottom and side walls and being spaced inwardly of said flange so that the forward portions of the inner surfaces of said top, bottom and side walls are exposed from the exterior of said ventilator, threaded adjustment means threadably mounted in and extending through the forward exposed portion of a selected one of said top, bottom and side walls and forwardly of said grill, said threaded adjustment means including an outer end for engaging a corresponding surface of said wall opening and an inner end with means for manually rotating the same from the exterior of said ventilator, and resilient means mounted on a selected one of said top, bottom and side walls opposite said one wall in which said threaded adjustment means is mounted, said resilient means extending outwardly from said opposite wall and including an outer end for engaging a corresponding surface of said wall opening, said resilient means maintaining said outer end of said threaded adjustment means in resilient contact with the opposite surface of said wall opening with any expansion or contraction of the ventilator dimensions during use.

4,587,893

GRAIN DRYING BIN

Donald B. Brockhaus; Calvin L. Fuehrer, both of Fremont; Walter E. Swartz, Wahoo, all of Nebr., and Vernon H. Sietmann, Laurel, Iowa, assignors to Stormor, Inc., Fremont, Nebr.

Filed Sep. 3, 1985, Ser. No. 771,595

Int. Cl.[4] E04H *7/22*

U.S. Cl. 98—55 **5 Claims**

1. A grain drying bin comprising,

a base floor,

a cylindrical wall extendin9 upwardly from said base floor,

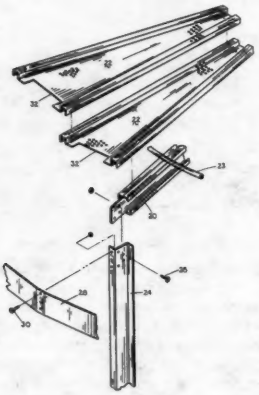
a roof mounted on the upper end of said wall,

a conically-shaped drying floor positioned within the bin and having its lowe periphery operatively secured to said wall and extending upwardly in an inclined direction therefrom,

said conically-shaped floor including a plurality of spaced-apart support members having upper and lower ends, and a perforated floor mounted on said support members,

the lower ends of said support members being operatively secured to said cylindrical wall,

and a vertically disposed, flat tension band positioned between the lower ends of said support members and said cylindrical wall and being secured to said support members and cylindrical wall,



said tension band extending completely around the lower end of said conical-shaped floor to transfer the weight of the conically shaped floor to said cylindrical wall in substantially a uniform manner.

4,587,894

CONTROL DEVICE FOR DOSING EMULSIFIERS IN CHOCOLATE MASS

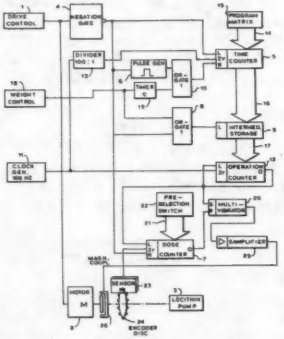
Jürgen Hörig, Heidenau, German Democratic Rep., assignor to Veb Kombinat Nagema, Dresden, German Democratic Rep.

Division of Ser. No. 626,623, Jul. 2, 1984, Pat. No. 4,563,361. This application Feb. 19, 1985, Ser. No. 702,450

Claims priority, application German Democratic Rep., Jul. 1, 1983, 252641

Int. Cl.[4] A23G *1/00*

U.S. Cl. 99—487 **4 Claims**



1. A device for dosing lecithin or similar emulsifier into a continuous stream of a chocolate mass, comprising means for detecting the weight rate of flow of the chocolate mass, a dosing pump for adding the emulsifier into the chocolate mass, control means for the dosing pump, a time counter coupled to the detecting means and to the control means to determine a first time interval corresponding to a next charge of the emulsifier into the stream of chocolate mass; means for generating digital signals corresponding to the first time interval and to a prescribed dosage of the emulsifier; an intermediate storage device for storing said digital signals; means for determining from the stored digital signals second time intervals each corresponding to a fraction of the first time interval; and means for activating the dosing pump during the second time intervals.

4,587,895

METHOD FOR THE RADIAL COMPRESSION OF CYLINDRICAL BODIES COMPOSED OF COMPRESSIBLE MATERIAL

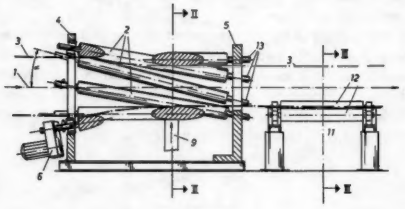
Wilfried T. Blauhüt, Linz, Austria, assignor to Chemie Linz Aktiengesellschaft, Linz, Austria

Filed Mar. 19, 1985, Ser. No. 713,741

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1984, 3415036

Int. Cl.[4] B65B *13/20*

U.S. Cl. 100—3 **4 Claims**



1. Method for the radial compression of cylindrical bodies composed of compressible material, in particular of rolls of wound flat structures, comprising moving the body to be compressed axially through a rotationally symmetrical space, tapering in the transport direction, whose diameter at the narrowest point is smaller than that of the body to be compressed and whose envelope is generated by several regularly spaced roller shaped bodies, rotating in the same direction, which cross the axis of rotation of the space in its second half seen in the transport direction at an angle of between 5° and 45° but do not intersect it, the body to be compressed executing a helical movement relative to these bodies generating the envelope of the space, and being compressed as a function of the ratio of its diameter to the diameter of the narrowest point and making permanent this compression by wrapping with strip or cord material at the narrowest point of the space.

4,587,896

APPARATUS FOR CLASSIFYING JUICE SQUEEZED FROM GRAPES

Dale F. Steinke, Guerneville, Calif., assignor to F. Korbel and Bros. Inc., Guerneville, Calif.

Filed Aug. 23, 1984, Ser. No. 643,427

Int. Cl.[4] B30B *9/14*

U.S. Cl. 100—117 **10 Claims**

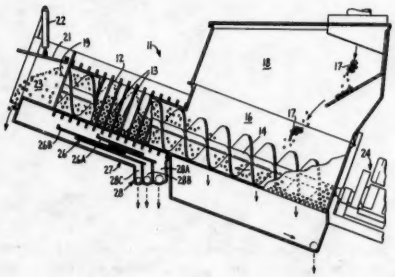
7. Apparatus for classifying and collecting different grades of juice squeezed from grapes in an inclined cylindrical dejuicer, comprising

a flattened trough positioned in substantially parallel subjacent relationship to the inclined cylindrical dejuicer and extending beneath the area of the dejuicer from which the juice drops,

a plurality of side by side open top receiving troughs at and above the lower portion of said flattened trough,

first and second fixed juice receiving pans interposed be-

tween said flattened trough and cylindrical dejuicer in parallel spaced relation thereto but staggered longitudinally thereof relative to each other, and



first and second adjustable juice receiving pans having their lower ends discharging onto said first and second fixed juice receiving pans respectively.

4,587,897

ROTARY OFFSET PRINTING MACHINE

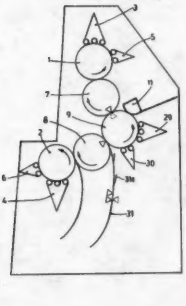
Hermann Fischer, Augsburg, Fed. Rep. of Germany, assignor to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

Continuation of Ser. No. 497,507, May 24, 1983, abandoned. This application Apr. 16, 1985, Ser. No. 723,004

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1982, 3220919

Int. Cl.[4] B41F *7/10*

U.S. Cl. 101—137 **4 Claims**



1. Versatile five-cylinder rotary sheet fed printing machine for, selectively, printing by prime offset printing and prime offset—verso wet or dry planographic printing, for printing on paper sheets comprising

a first plate cylinder (1)

a first inker (3) and a first damper (5) associated with said first plate cylinders;

a first rubber blanket cylinder (7) located in image transferring relation to said first plate cylinder (1) to apply a prime print image on a sheet;

a support cylinder (9) positioned for passage of the sheet being printed between the first blanket cylinder (7) and the support impression or counter cylinder (9);

a second plate cylinder (2);

a second inker (4) and a second damper (6) associated with said second plate cylinder;

a second rubber blanket cylinder (8) located in image transferring relation to said second plate cylinder (2) to apply a second prime print on the sheet, said second rubber blanket cylinder being positioned with respect to the support cylinder (9) for passage of the substrate being printed between the second rubber blanket cylinder (7) and the support cylinder (9);

and means for selectively applying a verso print image on the substrate including said support cylinder,

comprising

a set of cover elements for the support cylinder (9) including

(1) a flexible planographic printing plate (12) forming a planographic cover element;

(2) a rigid impression surface or counter surface cover element;

(3) a metal plate cover element;

(4) an elastic or yielding impression or counter surface cover element;

(5) a rubber blanket cover element;

attachment means (13–24) for selectively attaching a selected one cover element of the set on the surface of the support cylinder (9),

said attachment means comprising clamping means selectively accepting any one cover element of the set of cover elements;

and a further inker (29) selectively positionable in operative relation to a selected one of said cover elements on the support cylinder (9).

4,587,898

CORRUGATED PAPER INSTALLATION FOR MANUFACTURING OF PRINTED CORRUGATING PAPER CUTS WITH A CORRUGATED PAPER MACHINE AND A ROTARY PRINTING MACHINE INTEGRATED THEREIN

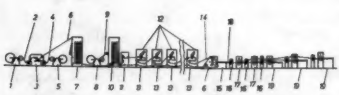
Udo Welschlau, Northeim, Fed. Rep. of Germany, assignor to VEPA Zellstoff - und Papierholding AG, Glarus, Switzerland

Continuation-in-part of Ser. No. 931,186, Aug. 4, 1978. This application Apr. 17, 1980, Ser. No. 141,105

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1977, 2745854

Int. Cl.[4] B41F *13/56*

U.S. Cl. 101—224 **3 Claims**



1. An arrangement for manufacturing printed corrugated paper cuts with a corrugated paper machine, comprising: an integrated rotary printing machine having a plurality of printing stations in said corrugated paper machine; longitudinal cutter means and transverse cutter means; drive means; said printing stations being integrated for printing a paper web with laterally adjacent areas of different width and length which are selectively connectable with said drive means; said printing stations carrying for each area printing forms mounted on an endless exchangeable carrier band of different lengths, said longitudinal cutter means and transverse cutter means being provided for different area lengths; transmission means having a friction coupling and a mechanical engagement coupling for driving integrated printing stations from said drive means of the corrugated paper machine; said transmission means of each printing station having a planetary gear stage with one input connectable via said two couplings with a drive shaft of the corrugated paper machine for setting carrier bands carrying printing forms of printing stations with reference to one another, said planetary gear stage having a second input connectable with at least one setting device, said planetary gear stage having one output leading to a printing cylinder of the printing station.

4,587,899

INKER FOR APPLYING AXIALLY PARALLEL STRIPES TO A ROTARY PRINTING MACHINE

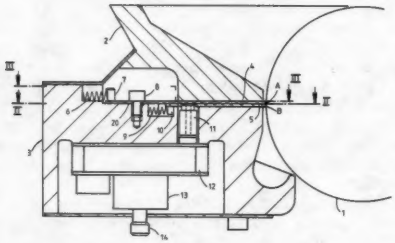
Klaus Theilacker, Friedberg, Fed. Rep. of Germany, assignor to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Augsburg, Fed. Rep. of Germany

Filed Jun. 27, 1985, Ser. No. 749,940

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1984, 3423735

Int. Cl.[4] B41F *31/02*

U.S. Cl. 101—365 14 Claims



1. Inker for a rotary printing machine having

an ink trough (2);

an ink receiving roller (1) positioned to receive ink from the ink trough;

and a plurality of ink metering elements located axially adjacent each other and positionable against the ink receiving roller (1) to control ink flow from the trough to the surface of the roller,

wherein, in accordance with the invention,

the ink metering elements comprise

two superposed plates (4, 5), each having a resilient front edge (A, B) formed with at least approximately matching recesses or notches (18, 16), said resilient front edges (A, B) engaging the surface of the ink receiving roller (1) so that, at the location of the recesses or notches, ink will be permitted to flow to the roller (1) and coat the roller in circular strips or rings of ink; and

means (11, 12, 13, 14) for axially shifting one plate (5) with respect to the other (4) to thereby change the relative position of the recesses or notches of said plates with respect to each other, and thereby control the width of the circular strips or rings of ink being applied to the roller.

4,587,900

MASTER RETAINING DEVICE FOR A PRINTING MACHINE

Susumu Oshio, Minato, Japan, assignor to Riso Kagaku Corporation, Shimbashi, Japan

Filed Jul. 17, 1985, Ser. No. 755,837

Claims priority, application Japan, Oct. 29, 1984, 59-227323

Int. Cl.[4] B41F *27/00*

U.S. Cl. 101—382 MV 7 Claims

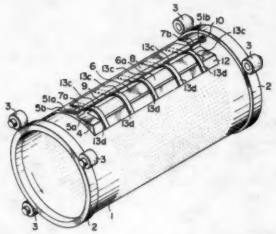
1. For a printing machine comprising a printing drum:

a stencil master sheet retaining device, comprising:

a magnet plate extending generally along a generator of said printing drum;

a clamp plate, made of magnetically attractable material, which can be selectively positioned either to a position in which it lies against said magnet plate, or to a position in which it is removed away from said magnet plate;

a removal strip which extends above said magnet plate generally between said magnet plate and said clamp plate; and



a means for raising said removal strip away from said magnet plate, when said clamp plate is removed away from said magnet plate.

4,587,901

PLATE HOLDING ROLLER PARTICULARLY FOR FLEXOGRAPHIC PRINTING APPLICATIONS

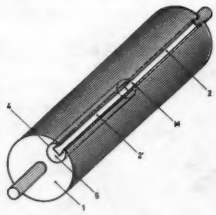
Gibellino Gianfranco, Trino Vercellese, Italy, assignor to Officine Meccaniche G. Cerutti S.p.A., Italy

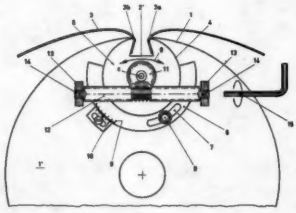
Filed Jul. 18, 1984, Ser. No. 631,856

Claims priority, application Italy, Jul. 29, 1983, 22329 A/83

Int. Cl.[4] B41F *1/28*

U.S. Cl. 101—415.1 7 Claims





1. A plate holding roller for flexographic printing applications comprising a roller having a longitudinal groove extending over one half the roller length, said groove provided with means for securing the ends of a plate thereto, said plate not being adjustable relative to said roller while secured on said roller; a circular cross-section longitudinal pocket formed in alignment with said groove in the remaining half of the roller length, said pocket being substantially tangential to the surface of said roller; a supporting body rotatably mounted within said pocket, said supporting body including a longitudinal groove extending the entire length of said supporting body and means for securing the ends of a plate to said supporting body; and means for selectively releasing said supporting body for rotation in said pocket relative to said roller without releasing the

means securing the ends of the plate attached thereto, and locking said supporting body relative to said roller, whereby the position of a plate mounted to the roller by said supporting body can be adjusted relative to a plate mounted to the remainder of the roller.

4,587,902

SUBORDINATE-AMMUNITION MEMBER WITH TARGET-DETECTING ARRANGEMENT

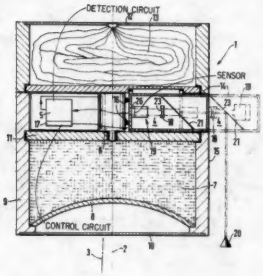
Friedrich Lindner, Lauf, and Helmut Kriz, Ruckersdorf, both of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Nuremburg, Fed. Rep. of Germany

Filed Jul. 25, 1984, Ser. No. 634,303

Claims priority, application Fed. Rep. of Germany, Jul. 26, 1983, 3326876

Int. Cl.⁴ F42C *13/02*

U.S. Cl. 102—213 **7 Claims**



1. Subordinate-ammunition member including a target-detecting arrangement oriented externally of the cylindrical wall structure of said member in parallel with the longitudinal axis of said member; the improvement comprising support means being displaceable from interiorly of said member externally of the wall structure thereof, and said target-detecting arrangement being relatively movably positioned on said support means.

4,587,903

TRIPPING SYSTEM FOR ELECTRICAL PERCUSSION FUSES

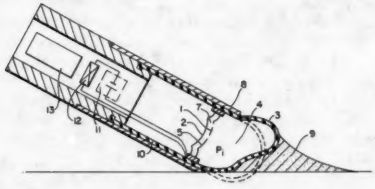
Friedrich Bertram, Schwaig; Uwe Brede, Fürth, and Gerhard Kordel, Nürnberg-Kornburg, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Dec. 7, 1983, Ser. No. 559,092

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1982, 3245375

Int. Cl.⁴ F42C *1/04, 19/06;* **H01H** *35/40*

U.S. Cl. 102—216 **6 Claims**



1. A tripping system for actuating a percussion fuse wherein an electric circuit is closed at the instant of impact of the system, which comprises a volume-variable pressure chamber partially or entirely enclosed by a cap of a deformable material and by a double-diaphragm electrical switch, one diaphragm of said switch which defines the pressure chamber exhibiting at least one perforation for allowing gradual equalization of pressure within the chamber and an interspace between diaphragms of said double-diaphragm electrical switch.

4,587,904

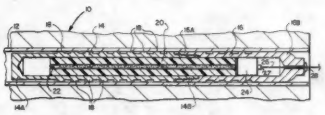
DEBRIS FREE PLUG ASSEMBLY FOR HEAT EXCHANGE TUBES

Irwin Berman, Montclair, and Joseph F. Sheehan, Clark, both of N.J., assignors to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Jan. 7, 1985, Ser. No. 689,429

Int. Cl.⁴ F42B *3/00*

U.S. Cl. 102—333 **11 Claims**



1. An explosively activated assembly for repairing a tube, said apparatus comprising a casing assembly disposed within said tube and having an internal bore and an outer diameter slightly less than the inner diameter of said tube, a force transmitting member extending within said bore, explosive means extending within said force transmitting member, booster means extending within said casing assembly for igniting said explosive means, and an energy transfer cord extending from said booster means; said casing assembly comprising first and second casing members each having a closed end and an open end, said casing members being connected together at their open ends to define an enclosed chamber, one of said casing members having a bore extending through its closed end for receiving, in a relatively close fit, said energy transfer cord, said energy transfer cord projecting from said closed end of said one casing member and adapted to connect said booster means to externally located detonator means for igniting said booster means and therefore said explosive means, so that said force transmitting member is expanded radially outwardly against said casing to expand said casing radially outwardly against the inner surface of said tube and plug said tube, said chamber containing the debris and gases resulting from detonation of said explosive means and said booster means.

4,587,905

WAD AND SLUG FOR A SHOTGUN CARTRIDGE

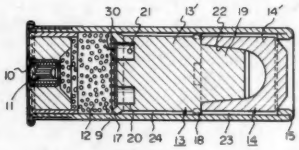
Nagatoshi Maki, 2-48-4, Kamiishihara, Chofu-shi, Tokyo, Japan

Continuation of Ser. No. 243,546, Mar. 13, 1981, abandoned. This application Nov. 25, 1983, Ser. No. 555,150

Claims priority, application Japan, Jul. 18, 1980, 55-100718; Nov. 17, 1980, 55-160827; Nov. 17, 1980, 55-163495

Int. Cl.⁴ F42B *7/08, 7/10*

U.S. Cl. 102—430 **5 Claims**



1. A wad for a shotgun cartridge having a case with a primer and powder therein, to be used with a slug which is held in the case by a crimp provided on the case and which has a diameter

dimensioned such that an annular gap is provided between the inside surface of the case and the slug, said wad being located in the case between the powder and the slug, wherein said wad comprises:

a substantially solid cylindrical body having a longitudinal axis, front and rear end faces, a cylindrical side surface, and an outside diameter smaller than the inside diameter of the case;

said cylindrical body including a plurality of independent, symetrically-located blind holes which extend a predetermined relatively shallow distance thereinto parallel to and spaced from the longitudinal axis of the body, from the rear end face of the body adjacent to the powder;

means circumferentially attached about the cylindrical side surface of the body adjacent to the rear end face to define a continuous gas seal for preventing escape of explosive gas produced by combustion of the powder along the cylindrical side surface, and for centering the rear end face coaxial with the case;

said body further including a plurality of independent, nonradial and separate restriction passages individually connected to the blind holes and which extend perpendicularly to imaginary planes including the axes of the associated blind holes and the axis of the body to open to the cylindrical side surface of the wad body adjacent to said circumferential seal means so as to give a rotational torque in the same predetermined direction to the wad body when the explosive gas is discharged from the restriction passages;

said body being provided, on the portion of the cylindrical side surface adjacent to the front end face thereof, with a plurality of independent, segmental projections;

male and female connection means for coaxially and snugly connecting the wad body and the slug; and

means for transmitting rotation of the wad body to the slug.

4,587,906

PNEUMATIC PROPULSION SYSTEM FOR CAR AND PASSENGER VEHICLES

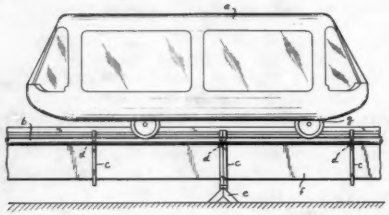
Oskar H. W. Coester, Rua David Francisco Mauricio 85, Porto Alegre, Rio Grande do Sul, Brazil

Continuation-in-part of Ser. No. 909,434, May 25, 1978, abandoned. This application Sep. 26, 1980, Ser. No. 190,926

Claims priority, application Brazil, Sep. 28, 1979, 7906255

Int. Cl.[4] B60U *3/04;* **B61B** *13/08*

U.S. Cl. 104—156 **4 Claims**



1. Pneumatic propulsion means for cargo or passenger vehicles comprising tubular means with a substantially planar upper surface, means for supporting said tubular means along a substantially horizontal path above the surface of the ground, track means attached adjacent said upper planar surface of said tubular means for supporting the wheels of a wheeled vehicle, means for establishing an air pressure differential comprising a relatively high pressure region and a relatively low pressure region within said tubular means, said tubular means containing a longitudinal slot along said upper surface thereof, in combination with at least one vehicle having wheel means cooperating with said track means of said tubular means, said vehicle having at least one rod attached thereto extending through said longitudinal slot of said tubular means, propelling means for the vehicle comprising a propelling fin device constructed to substantially fill the cross-sectional area of said tubular means and attached to the portion of said rod extending into said tubular means, said fin thereby separating said relatively high pressure from said low pressure region and thereby driving said fin and its attached vehicle in the direction of lower pressure, a longitudinal flap extending along said slot adapted to substantially completely close said slot, said flap being so constructed and arranged that said flap closes said slot when a pressure differential is established between said interior of said tubular means and the exterior atmosphere, said flap has on edge thereof attached adjacent one end of said longitudinal slot, and extends with its other edge to the opposite side of said slot, said flap being flexible and so constructed and arranged that when a pressure differential is established between the interior of said tubular means and the exterior atmosphere, said flap closes said slot, wherein one of high and low pressure regions in said duct is at atmospheric pressure, and said vehicle comprises means spaced from said fin in the direction of the atmospheric pressure region for opening said slot for the free passage of air therethrough whereby to reduce aerodynamic losses of air flow on said propelling means along said tubular means.

4,587,907

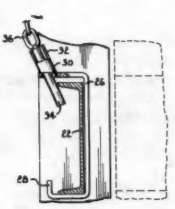
RAILROAD TIE TRANSPORT CAR

T. L. Haney, Jackson County, Mo., assignor to The Kansas City Southern Railway Company, Inc., Kansas City, Mo.

Filed Feb. 24, 1983, Ser. No. 469,152

Int. Cl.[4] B61D *3/08, 17/08*

U.S. Cl. 105—378 **13 Claims**



1. A railroad car for use in transporting cargo such as railroad ties and the like, said car comprising:

a flat bed;

a wheel assembly coupled with said bed for moving said bed over a track;

first and second siderails extending upwardly from and along opposite sides of said bed,

each of said siderails comprising a plurality of spaced apart vertically extending posts and a plurality of spaced apart horizontally extending rails, said rails including upper and lower rails extending between each pair of posts and an intermediate rail extending between each pair of posts and at a location between the upper and lower rails;

means for removably mounting the upper and lower rails between two adjacent posts on said first siderail;

means for fixedly mounting the intermediate rail between said two adjacent posts on said first siderail;

means for removably mounting the intermediate rail between two adjacent posts on said second siderail which are opposite said two adjacent posts on said first siderail; and

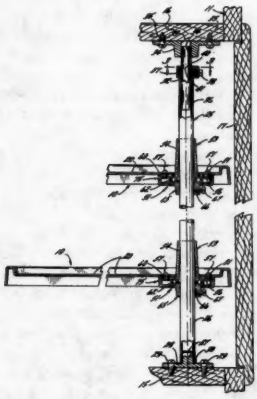
means for fixedly mounting the upper and lower rails between said two adjacent posts on said second siderail, each of said removable mounting means permitting the rail mounted thereby to be detached from its siderail to expose a space in the siderail through which the cargo can be unloaded.

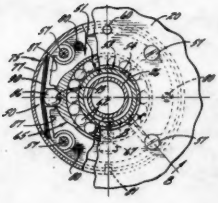
4,587,908

ROTARY SHELF ASSEMBLY WITH BEARING ASSEMBLY AND DETENT MECHANISM

William DeBruyn, Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.

Filed Mar. 12, 1985, Ser. No. 711,056
Int. Cl.[4] A47B *11/00, 57/00;* G05G *5/06;* F16M *13/00*
U.S. Cl. 108—142 9 Claims





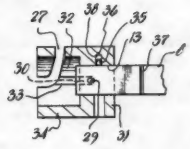
1. A shelf assembly comprising a fixed upright mounting post, a generally horizontal shelf, and means for mounting said shelf for rotation about said post while enabling said shelf to be retained selectively in a predetermined angular position relative to the post, said means comprising a rotatable annular bearing member secured rigidly to said shelf, a fixed annular bearing member spaced vertically from said rotatable bearing member and secured rigidly to said post, antifriction means located between said bearing members and supporting said rotatable bearing member and said shelf for substantially free rotation relative to said fixed bearing member and said post, said fixed bearing member including an outer peripheral surface having a detent notch therein, an annular cage fixed to and rotatable with said rotatable bearing member and encircling said fixed bearing member in outwardly spaced relation with the outer peripheral surface of the fixed bearing member, a detent rotatable with said cage and supported by the cage to move radially inwardly and outwardly, spring means acting between said detent and said cage and urging said detent radially inwardly while resisting radial outward movement of said detent, said detent seating in said detent notch to retain said shelf releasably in said predetermined angular position and being cammed out of said detent notch when said shelf is rotated with sufficient force to overcome the force of said spring means.

4,587,909

AGRICULTURAL DRILLS

Alfred J. Bailey, Coventry, United Kingdom, assignor to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

Continuation-in-part of Ser. No. 441,599, filed as PCT GB 82/00063, on Feb. 24, 1982, published as WO82/02993 on Sep. 16, 1982, § 102(e) date Nov. 1, 1982, abandoned. This application Oct. 5, 1984, Ser. No. 657,917
Claims priority, application United Kingdom, Mar. 6, 1981, 8107194; PCT Int'l Appl., Feb. 24, 1982, PCT/GB82/00063
Int. Cl.[4] A01C *5/00*
U.S. Cl. 111—67 8 Claims



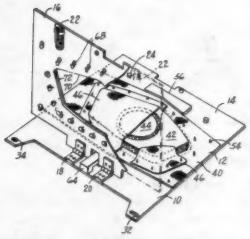
1. An agricultural drill having a plurality of seed dispensing units that are spaced across the width of the drill, two coaxial and axially adjustable drive shafts each extending across a respective half of the width of the drill and each being in driving engagement with the seed dispensing units associated with said respective half of the width of the drill, a feed rate adjustment mechanism that is operable to move the drive shafts axially thereby to adjust the feed rate of the seed dispensing units, a drive mechanism at one end of the drill that serves to selectively drive one or both drive shafts and that is adapted for driving engagement with that end of one drive shaft nearest the drive mechanism, and a quick release drive coupling provided between the two drive shafts comprising a radially projecting pin associated with one shaft and a slotted member slideable along the other shaft for connection and disconnection of said drive shafts, the pin being engageable in an axially and circumferentially extending slot formed in said slotted member so that it cooperates with the pin to produce a wedge action that urges the two shafts axially into abutting engagement when the pin is drivingly engaged with the slotted member.

4,587,910

WORKPIECE HOLDING DEVICE FOR AUTOMATIC SEWING

Max Raines, Salem, Mass., assignor to USM Corporation, Farmington, Conn.

Filed Sep. 4, 1984, Ser. No. 646,810
Int. Cl.[4] D05B *21/00*
U.S. Cl. 112—121.12 13 Claims



1. A workpiece holder which is attachable to positioning apparatus associated with the sewing head of an automatic sewing machine whereby the workpiece holder can be automatically positioned with respect to a reciprocating needle in the sewing head so as to allow a workpiece held within the

workpiece holder to be sewn said workpiece holder comprising:

a base plate having a plurality of spaced, sharp pointed pins which extend upwardly therefrom so as to define a pattern of spaced, sharp pointed pins that receive an elastic workpiece that is smoothly mounted thereover;

a cover plate, pivotally attached to the base plate, and having a pattern of spaced holes therein which acommodate the spaced, sharp pointed pins when said cover plate is latched with respect to said base plate;

means, on the cover plate, for shielding the sharp points of said sharp pointed pins from inadvertent contact with the operator of the sewing machine who handles the workpiece holder during the normal processing of the workpiece holder; and

means on the base plate for attaching said base plate to the positioning apparatus of the automatic sewing machine whereby the workpiece holder can be automatically positioned with respect to the sewing needle of the automatic sewing machine without said shielding means interfering with the sewing needle.

8. A device for holding a plurality of pieces of work that are to be joined and sewn together, said device comprising:

a base plate having a first plurality of sharp pins located around the periphery of an opening which allows a reciprocating sewing needle to pass therethrough so as to sew the pieces together; and

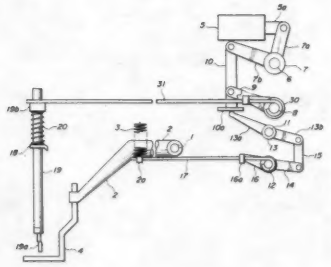
a hinged cover plate having a plurality of holes therein which accommodate the sharp pins that extend therethrough when said cover plate is pivoted downwardly over the base plate said cover plate furthermore having individual means for shielding each sharp pin extending through a respective hole.

4,587,911

WORKPIECE HOLDING-DOWN DEVICE IN A SEWING MACHINE

Tomoaki Kinoshita, Kanagawa, Japan, assignor to Tokyo Juki Industrial Co., Ltd., Chofu, Japan

Filed Nov. 13, 1984, Ser. No. 670,917
Int. Cl.[4] D05B *29/02*
U.S. Cl. 112—239 **2 Claims**



1. In a sewing machine having a main shaft rotatable to drive a needle to perform sewing on a workpiece, said sewing machine being characterized by:

a workpiece holding-down arm;

a workpiece holding-down foot at one end of said arm and movable between a lowered position in which said holding-down foot abuts against the workpiece and an upper position in which said holding-down foot is about the workpiece;

an auxiliary workpiece holding-down member movable between an operative position in which said auxiliary workpiece holding-down member engages the workpiece and an inoperative position in which said auxiliary holding-down member is above the workpiece;

disengageable interconnecting means interposed between the main shaft and auxiliary holding-down member for connecting between the main shaft and auxiliary holding-down member when the auxiliary holding-down member is in the operative position and interrupting the connection when said auxiliary holding-down member is in the inoperative position, said interconnecting means being operable to reciprocate said auxiliary holding-down member in synchronism with rotation of the main shaft when said auxiliary workpiece holding-down member is in the operative position, said interconnecting means being ineffective to reciprocate said auxiliary holding-down member when said auxiliary holding-down member is in the inoperative position;

electromagnetic means adapted to be energized when said sewing machine is about to start operation and deenergized upon the completion of formation of a predetermined number of seams; and

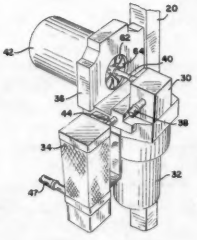
operation means operable in response to energization of said electromagnetic means to impart operation force to said holding-down arm and auxiliary holding-down member to cause the holding-down arm to move to said lowered position and to cause said auxiliary holding-down member to move to said operative position, said operation means being operable in response to deenergization of the electromagnetic means to cause said holding-down arm to move away from said lowered position and to cause said auxiliary holding-down member to move to said inoperative position.

4,587,912

SEWING MACHINE LUBRICATION SYSTEM

James W. Wolff, Chicago, and Sandra J. Liakus, Lisle, both of Ill., assignors to Union Special Corporation, Chicago, Ill.

Filed Mar. 21, 1985, Ser. No. 714,319
Int. Cl.[4] D05B *71/00*
U.S. Cl. 112—256 **9 Claims**



1. A lubrication system for a sewing machine, said lubrication system comprising:

means operated independently of said sewing machine for providing lubricant under pressure to various parts of said sewing machine wherein said lubricant providing means includes an independently driven motor which drives said lubricant providing means directly via a shaft; and means for filtering the lubricant before it is presented to the various parts of said sewing machine

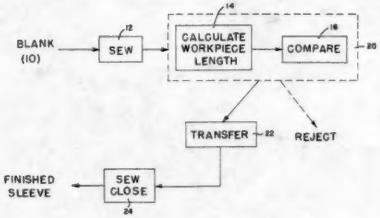
means operated independently of said sewing machine for heating said lubricant to a preset temperature; and

means driven by said shaft for circulating air about the filtering means.

4,587,913
AUTOMATIC SEWING APPARATUS

Chieh-Kung Yin, Hawthornwoods, and Maximilian Adamski, Barrington, both of Ill., assignors to Union Special Corporation, Chicago, Ill.

Filed Apr. 8, 1985, Ser. No. 721,013
Int. Cl.[4] D05B *19/00, 21/00*
U.S. Cl. 112—262.3 **12 Claims**



1. A sewing apparatus comprising:
means for advancing individual sheets of material along a predetermined path of travel;
means disposed along said predetermined path of travel for automatically calculating the individual lengths of said sheets; and
means for rejecting said sheets of material from said predetermined path when the length of said sheets is calculated to be outside a preselected range of sizes.

11. A method of sewing a workpiece comprising the steps of:
moving workpieces one after another along a predetermined path of travel;
sewing along the marginal edge of each workpiece as it is moving;
calculating the length of each workpiece as it is moved along the predetermined path; and
rejecting said workpiece from said predetermined path when the calculated length thereof is outside a predetermined range of sizes.

4,587,914
TUFTING MACHINE AND METHOD OF PREVENTING SEW THROUGH AND TAGGING IN PRODUCING A TUFTED PRODUCT

Roy T. Card, 4012 Creekwood Ter., Chattanooga, Tenn. 37421, and Joseph L. Card, 1515 Edgewood Cir., Chattanooga, Tenn. 37405

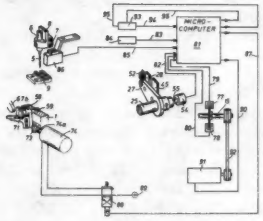
Continuation-in-part of Ser. No. 663,183, Oct. 22, 1984. This application Apr. 12, 1985, Ser. No. 722,507
Int. Cl.[4] D05C *15/00*
U.S. Cl. 112—266.2 **8 Claims**

1. A method for producing a tufted product in which a backing material is moved along a prescribed path, disposing a needle with yarn therein on one side of said first path and disposing a looper on the opposite side of said first path, reciprocating said needle in a path of reciprocation for inserting successive increments of said yarn through said backing material to form successive loops as the needle is successively inserted to a prescribed depth of penetration into said backing material, the improvement comprising the steps of:
(a) reciprocating the looper in synchronization with the reciprocation of the needle for moving the bill of the looper adjacent to said path of travel of said needle for moving the tip of said bill from one side of the path of travel of said needle to the other side of the path of travel of said needle so that the tip of said bill is on said one side as the needle is approaching its fully inserted position in said backing material and so that the yarn carried by the needle is moved by the needle past a portion of the side of the looper bill without the loop of yarn being caught by the bill of the looper;
(b) thereafter, during the same period in which the loop of yarn is inserted in the backing material, moving the looper bill in an opposite direction for moving the tip of said bill from said other side of said path of travel of said needle to said one side of said path of travel of said needle;
(c) then, during the same period in which the loop of yarn is inserted in the backing material, again moving the bill of the looper from said one side of said path of travel of said needle, to said other while the loop is inserted sufficiently through the backing material that said looper bill catches and holds that loop of yarn; and
(d) thereafter, releasing said loop from said bill.

4,587,915
METHOD AND SEWING MACHINE FOR APPROACHING A PREDETERMINED END POINT OF A SEAM

Herbert Wenz, and Franz Schneider, both of Kaiserslautern, Fed. Rep. of Germany, assignors to Pfaff Industriemaschinen GmoH, Fed. Rep. of Germany

Filed Nov. 20, 1984, Ser. No. 673,475
Claims priority, application Fed. Rep. of Germany, Nov. 24, 1983, 3342391
Int. Cl.[4] D05B *69/22, 69/18, 27/22*
U.S. Cl. 112—275 **6 Claims**



1. A sewing machine for approaching a selected end point of a seam comprising a main shaft, a needle mounted for vertical reciprocation and for back and forth swinging movement connected to said main shaft for being driven thereby, a material feed positioned adjacent the needle and being movable to move the material relative to the needle, a sensor arranged adjacent said needle and triggering the drive for positioning the needle in the end point, a pulse generator connected to said main shaft for generating pulses and a counter connected to said pulse generator for receiving the pulses generated thereby, variable drive means connected to said material feed and to said main shaft to move said material feed in a selected direction and at a selected feeding movement rate, a setting device connected to said variable drive means for setting the direction in an amount of feed movement and a micro-computer connected to said setting device and said pulse generator and said sensor and said material feed, said micro-computer being set to effect shortening of the length of at least one of the last stitches before the end point of the seam by moving the workpiece backwardly by the difference between the desired stitch length

and the stitch length set by said setting device before execution of said forward movement.

4,587,916

DEVICE FOR FIXING THE WISH-BONE OF THE SAIL-BOARD TO THE MAST IN A FAST AND RIGID MANNER

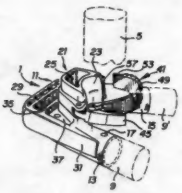
Normand Guerette, 9917 Cobourg, Montreal Nord Quebec, Canada H1H 4W5

Filed Oct. 22, 1984, Ser. No. 663,209

Claims priority, application France, Jan. 16, 1984, 84 00769; Jun. 25, 1984, 84 10190

Int. Cl.[4] B63H *9/00*

U.S. Cl. 114—39 **13 Claims**



1. A device for fixing the wish-bone of a sail-board to the mast of sail-board, said device comprising:

a U-shaped element intended to be connected to the mast, said U-shaped element having two sleeve-shaped ends into which are inserted both arms of the wish-bone;

a column-shaped, mast engaging body provided with a bearing surface which may be positioned onto the mast said mast engaging body being rigidly connected to the U-shaped element and forming therewith one single piece fixable to the mast; and

a lever-operated, hook clamping system rigidly mounted on said mast engaging body to fix it in a fast and easy manner to the mast after said mast has been positioned onto the bearing surface;

said fixation of the mast engaging body resulting in a fast and easy fixation of the U-shaped element and of the wish-bone attached thereto to the mast, wherein said lever-operated, hook-clamping system comprises:

a lever support fixed to the mast engaging body close to one side of the bearing surface of said body;

a lever mounted about a pivot on this support, said pivot having an axis substantially parallel to the mast when the same engages the bearing surface;

a strap having one end free and the other end mounted about a pivot onto the lever at a short distance from the pivot of this lever, the pivot of said strap being parallel to the one of said lever, said strap having a length sufficient to pass around the mast when the same engages the bearing surface, and comprising a plurality of teeth over a portion of its length close to its free end; and

a hook-clamping device connected to the mast engaging body close to the other side of the bearing surface for receiving and retaining the free end of the strap when this strap is passed around the mast with said mast engaged against the bearing surface, said hook-clamping device comprising a pawl urged against the teeth of the strap to engage the same;

said lever support and hook-clamping device being mounted at the ends of a stirrup mounted onto the mast engaging body so as to extend all around the surface of said body opposite to the bearing surface;

whereby the rigid body can be rigidly fixed onto the mast by merely tensioning the strap with the lever when this strap is engaged in the hook clamping device, said lever being positioned so as to remain in a dead position after the tension is exerted.

4,587,917

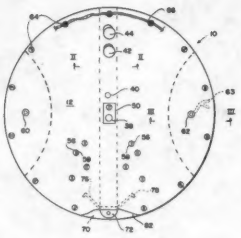
MULTI-USE WATERCRAFT

Donald W. Cantin, 38 Archer La., Stamford, Conn. 06905

Filed Jun. 11, 1984, Ser. No. 619,577

Int. Cl.[4] B63B *1/00*

U.S. Cl. 114—61 **19 Claims**



1. A multi-use watercraft comprising a hull having as a molded component of buoyant material,

a deck portion of circular plan outline,

a keel disposed beneath said deck portion extending the diametrical expanse thereof, said keel being relatively deep as compared to the depth of the deck portion and flaring inwardly from a widened upper merger thereof with the deck portion to a section of generally narrow substantially uniform width for the remainder and major depth course thereof,

pontoons depending from said deck portion symmetrically at either side of said keel in generally parallel relation therewith, the pontoons having longitudinal expanses of equal dimensions, said pontoons in plan outline being elliptical in shape and in vertical sectional outline being substantially the shape of an inverted triangle, the sides of which follow arcuate courses to merge one with the other at a distance below the deck portion, the pontoons being sized such as to provide a condition of hull flotation in which the deck portion is spaced a distance above the water surface,

a continuous sheath of a waterproof material intimately covering the outer surfaces of said deck portion, keel and pontoons, and

a plurality of fittings carried on said deck portion and adapted for removably receiving attachments associated with use of the hull as a specific one of multiple forms of watercraft.

4,587,918

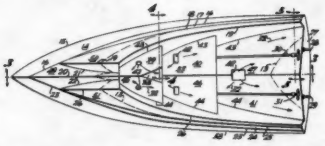
FINE ENTRY AIR RIDE BOAT HULL

Donald E. Burg, 15840 SW. 84 Ave., Miami, Fla. 33157

Continuation-in-part of Ser. No. 737,403, Nov. 1, 1976, Pat. No.

Int. Cl.[4] B63B *1/38*

U.S. Cl. 114—67 A **31 Claims**



1. In an improved boat hull containing a vertical centerline plane and that is partially supported by a pressurized gas lifting surface including a recess in the underside of the hull, which recess is supplied with pressurized gas from at least one powered gas supply source through at least one gas inlet in fluid communication with the recess, the improvement comprising:

stabilizing catamaran-like sidehulls with forward portions

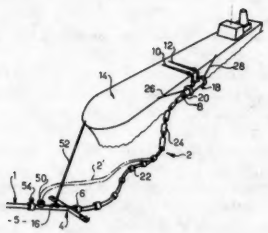
extending downwardly from surfaces of the hull, said sidehull forward portions beginning aft of but disposed proximal to a forward portion of s substantially rigid forward bow member that extends forwardly of the recess, said bow at least in part curvilinear, with the bow and sidehulls having keels which are substantially parallel to each other rearwardly from said forward portions, said sidehull keels diverging aft of said parallel portions; and an additional substantially rigid gas sealing bow member extending over a major portion of recess width, said bow member including at least one surface in part curvilinear and at least partially comprising at least one substantially V-shaped structure.

4,587,919

SIMPLIFIED SINGLE DEVICE FOR MOORING AND LOADING-UNLOADING TANKER VESSELS FROM A SUBMARINE CONDUIT FOR FEEDING OR DISCHARGING A FLUID, AND METHOD OF INSTALLING SAID SUBMARINE CONDUIT AND SAID SIMPLIFIED MOORING DEVICE

René M. A. Loire, San Francisco, Calif., and Michel J. E. Pagezy, Paris, France, assignors to Renee M. A. Loire and Tramco S.A., both of, France

Filed Mar. 29, 1983, Ser. No. 480,118
Claims priority, application France, Oct. 18, 1982, 82 17400
Int. Cl.[4] B63B *22/02*
U.S. Cl. 114—230 **11 Claims**



1. A simplified unitary device for mooring and loading/unloading a tanker vessel, comprising

a submarine conduit for the supply or discharge of a fluid,

at least one flexible pipe resistant to torsional stress, said at least one flexible pipe having a first end and a second free end,

a conduit end module resting upon a sea floor and provided with orifice means for connection with said first end of said flexible pipe, through which said flexible pipe communicates with said submarine conduit, said orifice means being fixed and non-pivotable with respect to said conduit end module and said first end of said flexible pipe being non-rotatably and fixedly connected to said orifice means,

a hose end module including at least one rotary joint, said hose end module being at least temporarily connected with loading or unloading conduits provided on the vessel,

said free end of said flexible pipe being at least temporarily connected with a part of said at least one rotary joint, through which said flexible pipe is at least temporarily communicated with the loading or unloading conduits provided on the vessel, said rotary joint being substantially coaxial with a portion of said flexible pipe proximate to said free end thereof, and

said conduit end module comprises mooring means for mooring the tanker vessel and having sufficient mass to withstand any pull from the vessel,

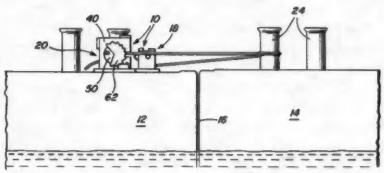
whereby when the vessel rotates or drifts with respect to said conduit end module under the action of external elements such as wind, current and waves, said flexible pipe is prevented from rotating due to said orifice means to which said first end of said flexible pipe is connected being fixed and nonpivotal with respect to said conduit end module whereby torsion is built up in said flexible pipe which is finally released by said rotary joint.

4,587,920

QUICK WIRE COUPLING AND RELEASE

Edward Thompson, Greenville, Miss., assignor to REC, Inc., Greenville, Miss.

Filed Jun. 15, 1984, Ser. No. 621,241
Int. Cl.[4] B63B *21/04*
U.S. Cl. 114—251 **6 Claims**



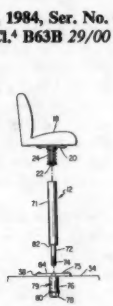
1. A quick wire coupling and release comprising a wire latch assembly and a cam assembly with the wire latch assembly receiving the bitter end of a wire rope or the like and the cam assembly receiving a transverse pin on a swaged socket at the end of a wire rope or the like, said cam assembly including a check position to secure the swaged socket and transverse pin to the cam assembly, said wire latch assembly enabling slack in the wire rope or the like to be taken up by hand and by manual manipulation of the wire latch assembly, said cam assembly including a fully retracted position to final tension the wire rope or the like when moved from the check position to the fully retracted position, said cam assembly including a pair of side plates, each having a notch in the vertical edge thereof, a pair of cam plates rotatably supported from the side plates and including radial notches therein for alignment with the notches in the side plates to receive the swaged socket and transverse pin on the end of a wire rope or the like, a lug on one of the cam plates to rotate the cam plates to a check position in which the notches in the cam plates are out of registry but adjacent to the notches in the side plates to lock the wire rope to the cam assembly without moving the wire rope longitudinally to any appreciable extent.

4,587,921

MOUNTING FOR BOATING EQUIPMENT

Larry B. Currey, Mesquite, Tex., assignor to CMT Industries, Inc., Mesquite, Tex.

Filed Jun. 20, 1984, Ser. No. 622,633
Int. Cl.[4] B63B *29/00*
U.S. Cl. 114—363 **13 Claims**



9. A base plate for use in a pedestal seat assembly, the pedestal seat assembly further including an extension, said base plate

for mounting on a boat having a surface to mount the base plate, comprising:

a surface member for being secured to the surface of the boat by fasteners; and

a generally cylindrical member secured to the surface member and extending through the surface of the boat, the interior of the cylindrical member defining a surface, at least a portion of said surface being threaded, the extension being threadedly received in the generally cylindrical member, the base plate permitting frequent removal of the extension to improve visibility during boat movement, the threaded attachment reducing the wobble induced in conventional pedestal seat assemblies using a sliding fit between the extension and base plate.

4,587,922

DEVICE FOR SUSPENSION AND RELEASE OF A LIFEBOAT

Arne A. Öiestad, P.O. Box 31, N-1300 Oslo Lufthavn, Norway

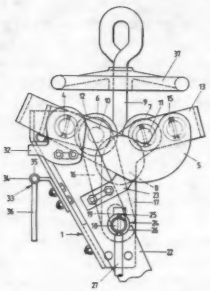
PCT No. PCT/NO83/00055, § 371 Date Aug. 6, 1984, § 102(e) Date Aug. 6, 1984, PCT Pub. No. WO84/02318, PCT Pub. Date Jun. 21, 1984

PCT Filed Dec. 5, 1983, Ser. No. 638,837

Claims priority, application Norway, Dec. 6, 1982, 824094

Int. Cl.[4] B63B *23/00*

U.S. Cl. 114—378 **10 Claims**



1. A device for the suspension and release of a load, especially a rescue craft or the like, comprising:

(a) engagement means including a pair of mutually movable gripping members (**6, 7**) for releasable engagement with a suspension member (**8**) at a free end of a suspension line;

(b) a holding member (**5**) for holding said gripping members in blocked engagement with said suspension member in a closed position; and

(c) means for eliminating said blocking of the gripping members;

(d) wherein said gripping members are mounted in said holding member which in turn is pivotally mounted in a support (**1**) for attachment to said load;

(e) said gripping members being articulated to said support by respective force-transferring carrying elements (**16, 17**), and said holding member being shaped to hold said gripping members in force-dependent, self-blocking engagement with said suspension member when said suspension member is loaded and the holding member is in said closed position;

(f) wherein said blocking eliminating means comprises an operating member (**22**) mounted in said support and a safety means (**24**) lockable in a position in which the holding member is blocked in said closed position, and which, when said safety means is disengaged, is movable so that said holding member is forcedly driven in an engagement releasing movement; and

(g) wherein one of said gripping members, when said holding member is blocked in said closed position without said suspension member being engaged, is arranged to be movable away from the other gripping member to allow introduction and reengagement of said suspension member.

4,587,923

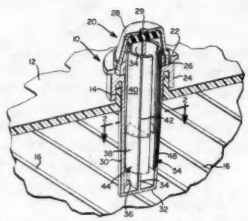
BATTERY CAP INDICATOR

Santiago Mejia, 525 N. Ocean Blvd. Apt. 1024, Pompano Beach, Fla. 33062

Filed Aug. 12, 1983, Ser. No. 522,529

Int. Cl.[4] G01F *23/30;* **G01N** *9/12;* **H01M** *10/48*

U.S. Cl. 116—228 **4 Claims**



1. A battery cap indicator for a battery cell, comprising:

(a) a cap having a circular flange for firmly engaging a periphery adjacent an opening in a battery casing and including a top section which projects upwardly and over the flange,

(b) the top section having an interior which is observable through a transparent portion thereof,

(c) an elongated cylindrical depending well open at its top and closed at the bottom thereof which is connected to the circular flange and is of sufficient length to extend downwardly beneath the battery casing to an electrolyte in close proximity to a plurality of battery plates within the battery casing,

(d) a longitudinally extending divider within the well for separating the interior thereof into two separate longitudinal semi-cylindrical channels,

(e) the well having a wall with port means for permitting movement of electrolyte into and out of the well to accurately reflect level of the electrolyte within the battery casing,

(f) first float means responsive to electrolyte density disposed within one of the channels, said first float means having a density which closely matches the density of the electrolyte and includes a closed semi-cylindrical float lower section and an upwardly extending curved projection forming a readily identifiable indicator upper portion which extends upwardly into the top section of the cap,

(g) second float means disposed within the other longitudinal channel and responsive to movement of the electrolyte level, said second float means having a lower semi-cylindrical float and curved projection forming a readily identifiable upper indicator portion which extends upwardly and into the top section of the cap,

(h) the length of the first and second float means with their respective indicator portions being approximately equal to the length of the well such that upward movement of the float means will move the indicator levels upwardly into the interior of the top section of the cap for observation,

(i) the elongated cylindrical depending well having a slight downward taper such that the lower most end thereof is slightly smaller than that of the upper end of the well,

(j) each float means having elongated longitudinally extending ribs which are disposed on an outer surface of said float means for engaging the inner surfaces of the longitudinal channels along substantially the entire length of said channels, and

(k) the indicator portions of said float means being separately identifiable such that the single battery cap indicator gives

a readily observable and sensitive reading for both electrolyte density and level for the cell.

4,587,924

APPARATUS FOR ELECTROSTATIC SPRAY-ENAMELING

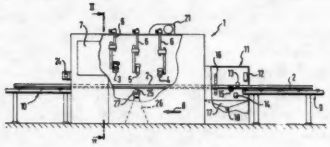
Karl-Heinz Reinlein, Dettelbach, and Bruno Stäblein, Würzburg, both of Fed. Rep. of Germany, assignors to Fulgurit GmbH & Co. Kommanditgesellschaft, Wunstorf, Fed. Rep. of Germany

Division of Ser. No. 561,927, Dec. 15, 1983, Pat. No. 4,534,311. This application Apr. 18, 1985, Ser. No. 724,355

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1982, 3246574

Int. Cl.⁴ B05D *1/04*

U.S. Cl. 118—70 **42 Claims**



1. An apparatus for electrostatically spray enameling plastic parts comprising:

a spray booth;

means for electrostatically spraying enameling mounted in said booth;

at least a first roller conveyor located in front of said spray booth and adapted to feed said plastic parts to said spray booth;

at least a second roller conveyor located behind said spray booth and adapted to remove said plastic parts from said spray booth; and

a cleaning system located after said second roller conveyor and adapted to apply a conducting cleaning liquid thereto.

4,587,925

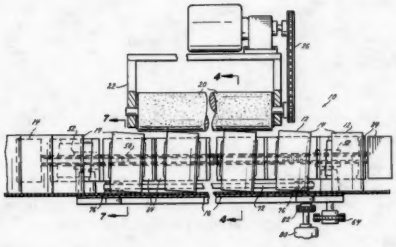
CONTINUOUS ADHESIVE APPLICATOR

Ronald Cook, Marquand, Mo., assignor to Tools & Machinery Builders, Inc., Arcadia, Mo.

Filed Oct. 24, 1984, Ser. No. 664,251

Int. Cl.⁴ B05C *1/02*

U.S. Cl. 118—211 **15 Claims**



1. An apparatus for applying a layer of fluid to containers such as cans or the like comprising:

a base,

movable restraining means on the base for supporting containers for successive movement in a predetermined processing line of travel past a station,

a fluid applying means adjacent the line at the station for contact by parts of the containers as they are transferred along the line,

means for rotating the containers in their restraining means as they are moved along the line,

holding means in the container restraining means for holding the containers and orienting them at a predetermined angle to the processing line so that parts of the containers contact the fluid applying means during movement and rotation of the containers, and

the holding means being positionable to engage the containers at sufficient points around them and that are disposed more than half way around the cans, to confine and prevent the containers from substantial displacement transversely from their oriented positions, but being spaced so as to avoid so tightly contacting them as to subject them to possible deformation or other damage.

4,587,926

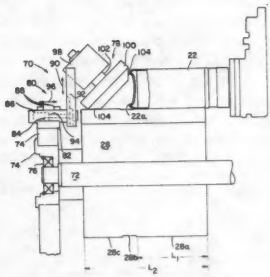
BOTTOM RIM COATER FOR INTERMITTENTLY OPERATED CONTAINER DECORATING APPARATUS

James Dominico, West Paterson, N.J., assignor to Van Dam Machine Corporation, West Paterson, N.J.

Filed Oct. 4, 1984, Ser. No. 657,547

Int. Cl.⁴ B05C *1/02*

U.S. Cl. 118—211 **12 Claims**



1. Intermittently operated apparatus for decorating cylindrical containers, each container having a cylindrical surface and a rim, said apparatus comprising:

rotatable mandrel wheel means;

a plurality of mandrel assembly means mounted on said mandrel wheel means for holding said containers on said mandrel wheel means;

surface applicator roll means for applying a coating of material to the cylindrical surface of each container;

supply means for supplying said material to said surface applicator roll means; and

rim applicator roller means in coating transfer communication with said surface applicator roll means for applying a coating of said material on the rim of each container.

4,587,927

PAINTING- AND EVAPORATION CABIN WITH AIR-RETURN VENTILATION

Klemens Beierling, Paderborn-Neuenbeken, and Hans-Jurgen Beierling, Gromitz, both of Fed. Rep. of Germany, assignors to RMG-Beierling GmbH, Industriestr, Altenbeken-Buke, Fed. Rep. of Germany

Filed Sep. 12, 1984, Ser. No. 650,328

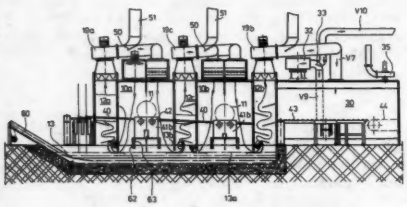
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1983, 3334257

Int. Cl.⁴ B05B *15/12*

U.S. Cl. 118—326 **7 Claims**

1. Apparatus for spraying a coating material on objects, comprising: at least two painting cabins adjacent to each other and having open inlets and outlets an object conveyor for

passing objects through the cabins via the inlets and outlets; color particle separators; ventilation means for feeding air flows via the color particle separators to the cabins and feeding a fresh air flow to cabins to effect a forced air circulation crossing the cabin comprising means dividing each cabin into at least two ventilation zones adjacent to each other in the direction of the conveyor movement, a first ventilator feeding fresh air into the zone adjacent to the inlet being the entrance zone, a second ventilator feeding the air flow leaving the entrance zone via a first separator to the adjacent second zone,



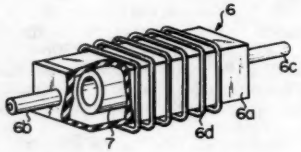
a third ventilator feeding the air flow leaving the second zone via the second separator to the first zone of the second cabin, a fourth ventilator feeding the air flow of the first zone of the second cabin via a third separator to the second zone of the second cabin and a fifth ventilator feeding the air flow of the second zone leaving the second cabin via a fourth separator to a combustion plant and wherein the first ventilator feeds a smaller fresh air flow via the entrance zone than the second ventilator draws from it, whereby an underpressure occurs in the entrance zone and a fresh air flow enters the first cabin via the inlet thereof.

4,587,928

APPARATUS FOR PRODUCING A SEMICONDUCTOR DEVICE

Toshio Yonezawa, Yokosuka, and Hisashi Muraoka, Yokohama, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Continuation of Ser. No. 935,959, Aug. 23, 1978, abandoned, which is a continuation of Ser. No. 753,446, Dec. 22, 1976, abandoned. This application Oct. 24, 1980, Ser. No. 200,546
Claims priority, application Japan, Dec. 24, 1975, 50-153378
Int. Cl.⁴ B05C *11/00*
U.S. Cl. 118—500 **11 Claims**



1. A process tube for fabricating a semiconductor device, said tube comprising a core of material selected from the group consisting of: sintered silicon carbide and silicon-impregnated sintered silicon carbide, at least the inner surface of said core having a layer of non-porous silicon carbide deposited thereon.

4,587,929

CLOSED LOOP MECHANICAL DEVELOPMENT CONTROL SYSTEM

Douglas P. Connolly, Webster; Gregory B. Swistak, Rochester, and Robert J. Tannascoli, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 30, 1984, Ser. No. 677,119
Int. Cl.⁴ G03G *15/09*
U.S. Cl. 118—657 **9 Claims**

1. An apparatus for developing an electrostatic latent image on an imaging member comprising a rotatably mounted cylindrical developer roll arranged adjacent to an imaging member forming a development nip therebetween;

means for supplying developer material to the development nip to form a wedge shaped layer of developer material in the development nip,

said developer material supply means comprising a developer material hopper having a dispensing aperture at a bottommost portion thereof adjacent the developer roll,

a dispensing slide in operative association with said developer material hopper,

said slide having in succession, a solid portion for sealing association with said hopper dispensing aperture, an aperture for developer material dispensing association with the aperture in said hopper and a cleaning/doctor blade for cleaning engagement with said developer roll to collect developer material in a pile as said developer roll is rotated,

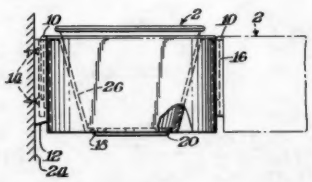
said slide being movable back and forth for sealing and developer material dispensing association with the developer material hopper aperture and for cleaning the developer roll.

4,587,930

PET FEEDING DISH HAVING DISPOSABLE LINER AND STATIONARY MOUNTING MEANS

Jeannie L. Trego, 338 N. Dillwyn Dr., Windy Hills, Newark, Del. 19711

Filed Oct. 1, 1984, Ser. No. 656,789
Int. Cl.⁴ A01K *5/00*
U.S. Cl. 119—61 **7 Claims**

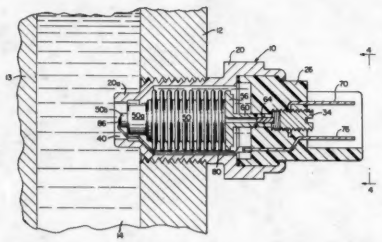


1. A combination feeding dish and wall mounting means comprising a receptacle having a base and side wall extending upwards from said base for receiving and holding a disposable liner, said liner removably placed into said receptacle, said receptacle having a male extension extending outwardly and downwardly from said side wall, and mounting means for mounting on a wall or the like comprising a female bracket for attachment to said wall for removably receiving said male extension and affixing said receptacle to said wall when said female bracket is attached to said wall and said extension is inserted into said bracket.

4,587,931
PRESSURE COMPENSATED TEMPERATURE SWITCH UNIT FOR PROTECTION OF AN INTERNAL COMBUSTION ENGINE

Wayne R. Duprez, Waltham, Mass., assignor to Standard-Thomson Corporation, Waltham, Mass.

Filed Dec. 10, 1984, Ser. No. 680,279
Int. Cl.⁴ F01D *11/18*
U.S. Cl. 123—41.15 **20 Claims**



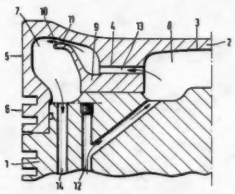
1. An engine protective switch unit adapted to be mounted in a coolant system of an internal combustion engine for operation of an engine protective monitoring device, the coolant system having a flow passage through which coolant liquid flows, comprising a housing provided with a cavity therein, the housing having an opening which provides communication between the flow passage of the coolant system and the cavity within the housing, pressure responsive means within the cavity of the housing and having a movable portion which is subject to pressure within the cavity, an electrical contact member, means attaching the electrical contact member to the movable portion of the pressure sensitive means for movement of the electrical contact member with movement of the movable portion of the pressure responsive means, an electrical engagement member adjacent the electrical contact member and engageable by the electrical contact member with movement of the movable portion of the pressure responsive means, vaporizable liquid within the pressure responsive means, the vaporizable liquid being heated by the coolant liquid and vaporizable to apply internal pressure upon the movable portion of the pressure responsive means for movement of the movable portion of the pressure responsive means, the electrical contact member being movable into engagement with the electrical engagement member by vapor pressure within the pressure responsive means which forces movement of the movable portion of the pressure responsive means.

4,587,932
LIQUID-COOLED COMPOSITE PISTON FOR INTERNAL COMBUSTION ENGINES

Horst Moebus, Neckarsulm, Fed. Rep. of Germany, assignor to Kolbenschmidt Aktiengesellschaft, Neckarsulm, Fed. Rep. of Germany

Filed Jan. 29, 1985, Ser. No. 695,999
Claims priority, application Fed. Rep. of Germany, Feb. 2, 1984, 3403624
Int. Cl.⁴ F02F *3/22*; F01P *3/10*
U.S. Cl. 123—41.35 **14 Claims**

1. In a liquid-cooled composite piston for an internal combustion engine, particularly diesel engines, which piston comprises a lower part forced against an upper part having an external cooling passage, and annular flange having a tongue which protrudes into said external cooling passage, which annular flange is clamped between an annular rib, which annular rib disposed between the inside of the upper portion and a surface which if formed on said lower portion and faces said rib, said annular rib constituting the radially inner boundary of said external passage, said external cooling passage being formed in the upper portion behind the top land and at least part of the ring-carrying portion of said piston and being open toward the interfacial plane between said upper part and said lower part of said piston, said annular rib surrounding a centrally disposed internal cooling chamber, which cooling chamber communicates with said external cooling passage through at least one radially extending coolant bores, said external

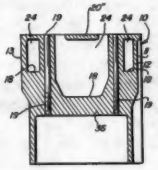


cooling passage and said cooling chamber communicating with a source of coolant, the improvement wherein said tongue is curved outwardly and its inner side face and the surface of said external cooling passage which is near the combustion define between them a narrow annular gap.

4,587,933
CYLINDER BLOCK FOR INTERNAL COMBUSTION ENGINE

Terrence M. Shaw, Columbus, Ind., assignor to Cummins Engine Company, Inc., Columbus, Ind.

Continuation-in-part of Ser. No. 339,126, Jan. 13, 1982, abandoned, which is a continuation of Ser. No. 104,097, Dec. 17, 1979, abandoned. This application Aug. 19, 1983, Ser. No. 525,255
Int. Cl.⁴ F02F *1/36*
U.S. Cl. 123—41.67 **9 Claims**



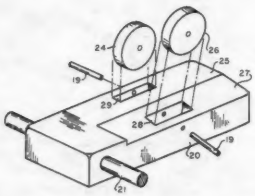
1. In an internal combustion engine, a cylinder block having a cylinder head removably secured thereto by a plurality of restraining bolts, said block comprising a cooling jacket having interconnected opposing load-bearing side and end walls and a floor section; a cylinder tube portion located substantially within said cooling jacket and comprising a plurality of relatively spaced substantially free-standing cylinder tubes supported by and perforating said floor section; said tubes, side walls, end walls and floor section being adapted to coact with the cylinder head to form a cavity through which a coolant is adapted to circulate; an elongated reinforcing rib disposed outside said cavity, said rib integral with and projecting downwardly from said floor section and having at least a portion thereof extending intermediate adjacent cylinder tubes, said portion having a lowermost free edge; means for receiving said restraining bolts and being positioned relative to said cylinder tubes for providing substantially uniform perimetrical support of said tubes when said restraining bolts are tightened to secure the head to the block; and means for substantially restricting radial movement of the upper portion of said cylinder tubes, said movement restricting means comprising a plurality of elongated struts substantially radially extending from said cylinder tubes and connected to predetermined walls of said cooling jacket.

4,587,934

VARIABLE-TIMING VALVE ACTUATING MECHANISM

Keith J. Moores, P.O. Box 10, Apopka, Fla. 32703

Filed May 16, 1983, Ser. No. 495,073
Int. Cl.[4] F01L *1/08*
U.S. Cl. 123—90.18 4 Claims



1. In an internal combustion engine having a plurality of valves and a crank shaft, the valve actuating apparatus comprising:

cam shaft bearing means;

a cam shaft rotatably and slidably disposed in said bearing means and adapted to be movable axially, said shaft having a set of external spiral splines at one end thereof;

timing gear means driven from the engine crank shaft including a timing gear and a cam shaft driving member, said driving member having a set of internal spiral splines coupled to said external spiral splines of said cam shaft, said timing gear means serving to rotate said cam shaft;

a plurality of dual cams disposed along said cam shaft, one of said dual cams associated with each of the valves, each of said dual cams having a first cam portion having a uniform axial camming surface profile and a second cam portion having a non-uniform axial camming surface profile;

a plurality of rocker arms with one of said rocker arms operatively associated with each valve and each of said dual cams, each of said rocker arms having a first cam follower for contacting said first cam portion and a second cam follower for contacting said second cam portion, each of said rocker arms including a body portion having a generally horizontal first surface and a second surface at a small angle to said first surface, a generally semi-circular recess in said first surface for holding said first cam follower, and a generally semi-circular recess in said second surface for holding said second cam follower, each of said first and second cam followers including a generally circular disk, and a retaining pin for retaining said disk in said recess, said first and second surfaces of said rocker arms disposed to provide a rolling line contact between said cam followers and said camming surfaces, and operative contact between said cam followers and respective ones of said recesses;

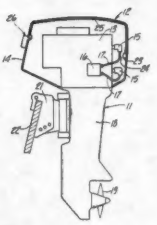
governor means attached to said driving member and coupled to said cam shaft for moving said cam shaft axially in said bearing means to a position proportional to the rpm of said engine, such movement of said cam shaft causing said spiral splines to thereby advance or retard the rotational position of said cam shaft causing the point of opening of each of said valves to advance or retard, said first cam follower adapted to contact said first cam portion for 360° only over a range of rpm from low to medium and said second cam follower adapted to operatively contact said second cam portion only over a range of rpm from medium to maximum, said non-uniform profile of said second cam portion selected to provide optimum valve overlap, optimum intake opening angle, optimum exhaust valve opening angle, optimum intake valve timing, and optimum exhaust valve timing for the internal combustion engine over said medium to maximum rpm range.

4,587,935

OUTBOARD MOTOR WITH ENGINE TACHOMETER

Toshiyuki Yamazaki, Iwata, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Japan

Filed Feb. 8, 1985, Ser. No. 699,644
Claims priority, application Japan, Feb. 16, 1984, 59-26035
Int. Cl.[4] F02B *77/08;* G01P *3/48*
U.S. Cl. 123—198 R 11 Claims



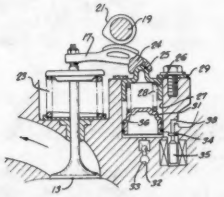
1. In an outboard motor comprising a power head containing an internal combustion engine surrounded by a protective cowling, an air gap formed in said power head between a portion of said internal combustion engine and said proective cowling, a drive shaft housing fixed beneath said power head and carrying marine propulsion means driven by said internal combustion engine, and electrical generating means driven by said engine for generating electrical output that varies with the speed of said internal combustion engine, the improvement comprising sensor means carried by said cowling in proximity to said electrical generating means for generating an electrical signal related to the electrical output of said electrical generating means, indicator means carried by said cowling and positioned to be viewed by an operator of said motor for providing a speed indication in response to an electrical signal, and means for transmitting a signal from said sensor means to said indicator means.

4,587,936

CONTROL APPARATUS FOR INTAKE AND EXHAUST VALVES OF AN INTERNAL COMBUSTION ENGINE

Masaaki Matsuura, Tokyo, and Yoshikatsu Nakano, Saitama, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 9, 1982, Ser. No. 416,326
Claims priority, application Japan, Sep. 10, 1981, 56-141712; Sep. 10, 1981, 56-141713; Sep. 10, 1981, 56-141715; Sep. 24, 1981, 56-149627; Sep. 24, 1981, 56-150920
Int. Cl.[4] F01L *9/02*
U.S. Cl. 123—315 10 Claims



1. An internal combustion engine having a cylinder and a piston slidable in the cylinder, comprising

at least one intake passage in communication with the cylinder, each said intake passage having an intake valve for controlling communication with the cylinder;

a plurality of exhaust passages in communication with the cylinder, each said exhaust passage having an exhaust valve for controlling communication with the cylinder; and

means for opening and closing said intake and exhaust valves, said means including disabling means for maintaining less than all said exhaust valves in a closed position through a complete exhaust cycle in response to an operating condition of the engine.

4,587,937

AUTOMATIC SPEED CONTROL SYSTEM FOR MOTORCYCLES

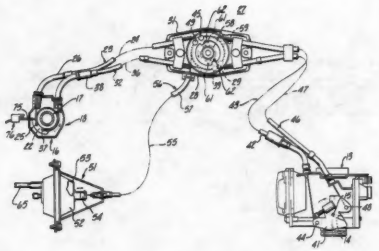
Yutaka Masuda, Fukuroi, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Japan

Filed Aug. 29, 1984, Ser. No. 645,486

Claims priority, application Japan, Aug. 31, 1983, 58-160038

Int. Cl.⁴ F02D *31/00*

U.S. Cl. 123—349 **18 Claims**



1. An automatic speed control mechanism for a motorcycle or the like comprising a throttle movable in opening and closing directions for controlling the speed of the motorcycle, an operator actuated speed control movable by the operator in either of a selected opening and closing direction, connecting means for positively coupling said operator actuated speed control to said throttle for said throttle opening when an operator moves said operator actuated speed control in the opening direction and for positively closing said throttle when an operator moves said operator actuated speed control in the closing direction, and actuator means for automatically positively positioning said throttle, sad actuator means being operative to provide a force sufficient to move said throttle in its opening position but less than the force exerted by said operator actuated speed control in its closing direction for manual override and reduction of the speed regardless of the position of the actuator means.

4,587,938

CONTROL DEVICE FOR CONTROLLING AIR-FUEL RATIO AND SPARK TIMING OF AN INTEGRAL COMBUSTION ENGINE

Nobuyuki Kobayashi, Toyota; Katsunori Yagi, Toyoake, and Toshimitsu Ito, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed May 7, 1985, Ser. No. 731,436

Claims priority, application Japan, May 7, 1984, 59-91592

Int. Cl.⁴ F02P *5/00*; F02B *23/00*

U.S. Cl. 123—416 **10 Claims**

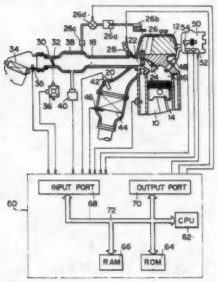
1. A control device for controlling the air-fuel ratio and the ignition timing of an internal combustion engine having a fuel injector, a spark plug, and a throttle valve, said device comprising:

first sensor mean for sensing engine operating conditions representative of the quantity of the intake air introduced into the engine;

second sensor means for sensing whether the opening of the throttle valve is above a predetermined valve;

fuel injection control means including means for determining the air-fuel ratio in response to outputs from said first and second sensor means such that the air-fuel ratio is determined in a first fashion with a first predetermined lean limit value when the opening of the throttle valve is below said predetermined value and in a second fashion with a second predetermined lean limit value when the opening of the throttle valve is above said predetermined value, said first predetermined lean limit value being larger than said second predetermined lean limit value;

ignition control means including means for determining an ignition timing in response to outputs from said first and said second sensor means such that the ignition timing is determined in a first timing pattern in relation to the air-fuel ratio in said first fashion and in a second timing pattern in relation to the air-fuel ratio in said second fashion, respectively, the first timing pattern being substantially on the spark advance side with respect to said second timing pattern; and



delay means which causes a delay in change-over of the ignition timing between said first and said second timing patterns relative to the change-over of the air-fuel ratio between said first and said second fashions when the opening of the throttle valve is changed beyond said predetermined value.

4,587,939

SAFETY DEVICE FOR A MICROCOMPUTER CONTROLLED INTERNAL COMBUSTION

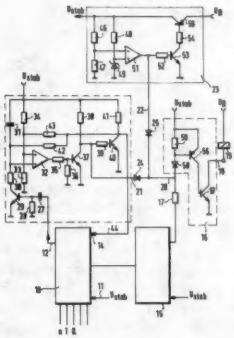
Herman Hemminger, Möglingen; Werner Jundt, Ludwigsburg; Sybille Weller, Oberriexingen, and Peter Werner, Wiernsheim, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 25, 1984, Ser. No. 664,889

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1983, 3342848

Int. Cl.⁴ F02M *51/00*; H02H *3/24*

U.S. Cl. 123—479 **6 Claims**



1. A safety device for a controlling unit of a fuel injection system of an internal combustion engine controlled or regu-

lated by a micro-computer, comprising a voltage source for the microcomputer and its peripheral devices; a first monitoring means responsive to voltage breaks in said voltage source to produce a first signal applied to said controlling unit for adjusting the same to a safety position while the microcomputer remains operative; and a second monitoring means responsive to the operability of the microcomputer to produce a second signal applied to said controlling unit for adjusting the same to said safety position when a non-operative condition of the microcomputer caused by voltage fluctuations is detected.

4,587,940

FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

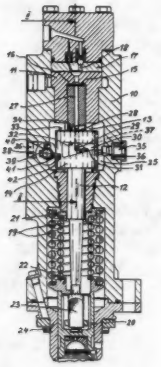
Walter Schmid, Munich, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 6, 1985, Ser. No. 730,617

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1984, 3428176

Int. Cl.[4] F02M *59/20*

U.S. Cl. 123—503 **11 Claims**



1. A fuel injection pump provided with a housing for internal combustion engines comprising at least one pump piston defining a pump work chamber, a control slide having at least one oblique control edge axially displaceable on said pump piston, said control slide adapted to control two control bores arranged to discharge in an axially spaced manner on a jacket face of said pump piston and further adapted to communicate via a conduit with said pump work chamber, said bores adapted to control supply onset and end of supply, at least one window-like recess in said control slide, said recess having a lower oblique control edge and an upper control edge which limit said recess, whereby at bottom dead center (UT) of said pump piston one of said bores is uncovered by said recess and said other bore for said supply onset is covered by said upper control edge and further that said end of supply is effected by means of the uncovering of said other bore by means of said lower oblique control edge.

4,587,941

INTAKE BURNER

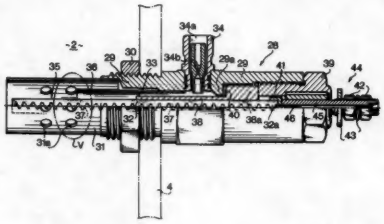
Hidetoshi Mishina, Tokyo; Hiroshi Takahashi; Hisatsugu Iizuka, both of Kanagawa; Noriyoshi Nakanishi, Kagoshima; Noriaki Tateno, Kagoshima, and Shigetoshi Toeda, Kagoshima, all of Japan, assignors to Isuzu Motors Limited and Kyocera Corp., both of Tokyo, Japan

Filed Sep. 30, 1983, Ser. No. 537,640

Claims priority, application Japan, Sep. 30, 1982, 57-147048[U]; Sep. 30, 1982, 57-147049[U]; Sep. 30, 1982, 57-147050[U]; Sep. 30, 1982, 57-147051[U]; Sep. 30, 1982, 57-147052[U]; Sep. 30, 1982, 57-147053[U]; Oct. 30, 1982, 57-165656[U]

Int. Cl.[4] F02M *31/00*

U.S. Cl. 123—550 **27 Claims**



1. In combination, an intake burner and an internal combustion engine having an air intake system having an air intake tube, said intake burner comprising:

(a) an outer tube adapted to be attached to the air intake tube;

(b) an elongated heater mounted in said outer tube, said heater comprised of an elongated ceramic rod having an outer surface, and a heating resistor embedded therein, said outer surface of said rod at one end constituting a vaporizing surface and a longitudinally spaced combustion surface at the other end;

(c) a holder extending over and surrounding said one end of said heater ceramic rod with a space therebetween, said outer surface of said one end of said ceramic rod at least partially exposed within said holder with said other end of said ceramic rod protruding out of said holder, and with said outer surface thereof exposed;

(d) fuel feed means for feeding fuel into said space between said holder and said one end of said heater ceramic rod; and

(e) a support member attaching said one end of said heater to said outer tube;

(f) the spaces intermediate said holder, said one end of said heater ceramic rod, fuel feed means, and support member together defining a vaporizing region for vaporizing fuel supplied by said fuel feed means, and the region around said exposed other end of said ceramic rod defining a combustion region for burning vaporized fuel supplied from said vaporizing region.

4,587,942

BREAKERLESS IGNITION SYSTEM AND METHOD OF MANUFACTURE THEREOF

Bob O. Burson, East Longmeadow, Mass., assignor to R. E. Phelon Company, East Longmeadow, Mass.

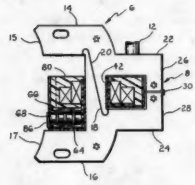
Filed Nov. 7, 1983, Ser. No. 549,089

Int. Cl.[4] F02P *3/06*

U.S. Cl. 123—599 **8 Claims**

1. Coil module for a breakerless ignition system having a first core with at least two-leg portions for carrying flux generated by rotatable magnet means comprising a unitary housing with an ignition transformer coil having a primary winding and a secondary winding coaxially disposed on said first core and within said housing and a trigger coil also disposed within said housing adjacent one of said leg portions and encapsulated within a potting compound disposed therein, said trigger coil

being disposed coaxially about a second core which includes a shank portion within said housing and an outer pole portion



disposed externally of said housing, the longitudinal axis of the shank portion of said trigger coil being offset a substantial distance from the axis from said transformer coil.

4,587,943

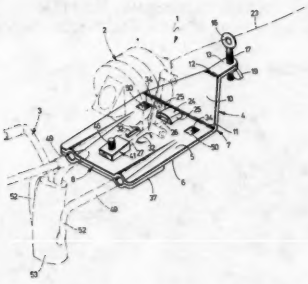
FISHING SLINGSHOT FIXTURE

Alex J. Ross, R.D. #1, Butlerville, Ind. 47223

Filed Apr. 15, 1985, Ser. No. 723,017

Int. Cl.[4] F41B 7/00

U.S. Cl. 124—20 R **2 Claims**



1. A fishing slingshot fixture adapted to receive a fishing reel and a slingshot detachably coupled thereto comprising a base plate having a top surface, a bottom surface, a front end and a back end and having provided thereon a guide arm having a free end having provided thereon a guide eye adapted to guide a fishing line; said base plate having provided on the top surface thereof a front reel holder adapted to receive a front foot of a fishing reel removably inserted therein, said front reel holder being adapted to prevent twisting or lateral slippage of said reel relative to the said base plate; said base plate also having provided therein socket means and guide means adapted to receive a pair of slingshot mounting rods removably inserted therein and adapted to prevent twisting or lateral slippage of said rods relative to said base plate, and constraining means adapted to prevent twisting or lateral slippage of a foot of a fishing reel relative to said base plate; clamping means adapted to engage and clamp a pair of slingshot mounting rods and a fishing reel to said base plate; and fastening means adapted to couple the aforesaid clamping means to said base plate.

4,587,944

CROSSBOW STOCK

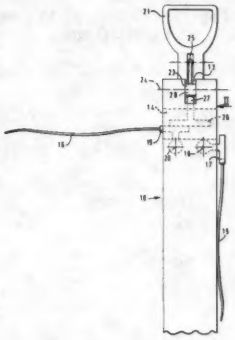
Bernard T. Barnett, Ryton, Nr. Shifnal, England, assignor to B & P Barnett Limited, West Midlands, England

Filed Aug. 19, 1983, Ser. No. 526,492

Claims priority, application United Kingdom, Dec. 17, 1982, 8235975

Int. Cl.[4] F41B 5/00

U.S. Cl. 124—25 **2 Claims**



1. A crossbow stock having a guide surface along which a bolt slides when fired from the bow and a stirrup mounted on the fore-end portion of the stock for pivoting relative thereto about a stirrup axis between a first position in which the stirrup extends from the stirrup pivot axis in a direction longitudinally of the stock beyond the fore-end of the stock and a second position in which a part of the stirrup remote from the stirrup axis lies adjacent to the stock, there being provided means for restricting the range of pivoting movement of the stirrup relative to the stock to prevent the stirrup occupying a position above the level of the guide surface of the stock when the stock is in the normal position of use with the guide surface facing upwardly and defining a horizontal path for a bolt.

4,587,945

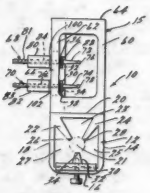
ARROW SUPPORT, SIGHT AND GUIDE

Darlan R. Little, 4451 Comanche Dr., Okemos, Mich. 48864

Filed Nov. 14, 1983, Ser. No. 551,196

Int. Cl.[4] F41B 5/00

U.S. Cl. 124—87 **4 Claims**



1. In an arrow support, sight and guide, the combination including a body defining a passageway open at each end and having a longitudinal axis, a plurality of substantially equally angularly spaced ribs carried by said body and projecting into said passageway, said ribs terminating at substantially flat support surfaces extending longitudinally of said passageway, said support surfaces being substantially equally radially spaced from the longitudinal axis of said passageway and being adapted to engage tangentially and with line contact only the periphery of a cylindrical shaft of an arrow, each of said support surfaces having a length substantially greater than the

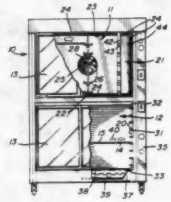
maximum outside diameter of a shaft of an arrow to be supported thereby, and sighting means carried by said body, said sighting means including a sighting pin disposed in a vertical plane normal to the longitudinal axis of said passageway.

4,587,946

MOBILE BAKING OVEN AND PROOFER

Jacques Doyon, 10e rue ouest, St-Côme, Beauce, Quebec, and Maurice Doyon, 850, 15e rue ouest, St-Georges, Beauce, Quebec, both of Canada

Filed Feb. 1, 1985, Ser. No. 697,446
Int. Cl.[4] A21B *1/08*
U.S. Cl. 126—20 **9 Claims**



1. A baking oven comprising a housing having a proofer compartment and baking compartment, doors for access to said compartments, support means for supporting dough products in said compartments, heating and convection means associated with said proofer compartment, moisture producing means associated with said proofer compartment in communication with a hot air current generated by said heating and convection means, said baking compartment having a rear wall supported in spaced relationship to interior surfaces of said baking compartment to define an outer circumferential convection opening thereabout, an air intake port in said rear wall, an impeller fan behind said rear wall, heating means positioned about said fan for heating air drawn through said intake port and expelled through said circumferential opening forwardly of said rear wall creating a recirculated heated air flow distributed through said baking compartment, a metal wall and a drip pipe positioned above the metal wall for releasing water thereon after said wall has been heated whereby to produce steam which is released in said recirculated heated air flow, said metal wall being formed by a plurality of horizontal metal plates having an outwardly bent upper horizontal flanged end and drip wall, said plates being spaced from a rear surface of said rear wall in non-obstructing relationship to said air intake port, said drip pipe extending longitudinally above a top one of said plates for releasing water droplets on said flange end, said plates being secured in a common plane and having their flanged end overlapping a lower edge portion of the drip wall of a preceding plate and defining a steam release opening therebetween.

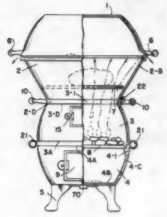
4,587,947

COMPACT PORTABLE GRILL APPARATUS

Rioe Tomita, P.O. Box 1321, Kaneohe, Hi. 96744

Filed Jul. 10, 1984, Ser. No. 629,564
Int. Cl.[4] F24B *3/00*
U.S. Cl. 126—25 R **4 Claims**

1. Compact portable outdoor grill comprising a base body having a lower end and an upper end, means at the upper end of the base body for receiving a grill body, a grill body having an upper end and a lower end and means at the lower end of the grill body for connecting to an upper end of the base body, the base body having lower and upper sections, the lower section of the base body having floor means at a lower end thereof and having an open upper end and means at the upper end of the lower section of the base body for receiving a lower end of the upper section, the lower end of the upper section of the base body having connection means for connecting to the upper end of the lower section of the base body, the upper and lower sections of the base body having telescoping shapes so that, when the upper section of the base body is removed and inverted, one of the base body sections fits within the other base body section and the upper and lower sections and the grill body having substantially identical heights so that the upper and lower sections fit within the grill body in uniform



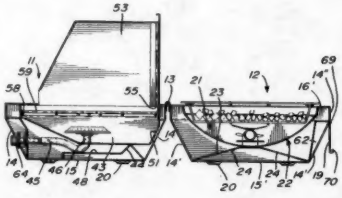
height when in a shipping carton, wherein the grill body has grate receiving means positioned within the grill body and spaced slightly upward from a lower end thereof and further comprising grate means for positioning within the grate receiving means and wherein the lower section of the base body has grate receiving means positioned within an upper end thereof whereby the grate may be interchangeably mounted on the lower section of the base body and on the grill body.

4,587,948

PORTABLE GAS-FIRED COOKING DEVICE

Allen Haglund, Vancouver, Canada, assignor to Camper Delight Sales Corp., Vancouver, Canada

Filed Mar. 20, 1985, Ser. No. 713,803
Claims priority, application Canada, Jan. 23, 1985, 472689
Int. Cl.[4] F24C *3/14*
U.S. Cl. 126—38 **18 Claims**



1. A portable cooking device comprising a housing having two concave cooking sections hinged together along a respective side wall whereby said sections may be disposed side by side with their open ends facing upwardly and displaceable to be juxtaposed with their open ends facing one another; said sections each having a bottom wall, opposed side walls and opposed end walls; one of said concave cooking sections having a heat generating element secured therein beneath a heat transmitting support frame, the other of said concave cooking sections having a gas burner assembly supportable on said bottom wall thereof below a further heat transmitting support frame, said assembly having an open top end pan in the form of a concave curved heat reflector dish which has a gas burner element disposed substantially centrally therein, a flame shield over said burner, and support means to maintain said reflector dish spaced from said side walls and end walls of said other section, said support means being a secondary heat reflector plate having opposed angulated support side walls to support said heat reflector dish elevated from said bottom wall, said heat reflector dish being dimensioned to fit inside said other

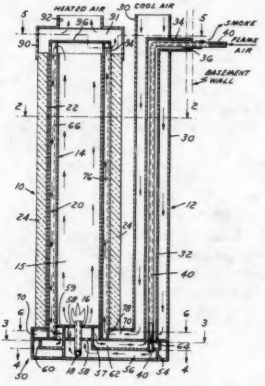
section spaced from said opposed side and end walls thereof, and ventilation means to ventilate said pan.

4,587,949

COMBUSTION HEATER

Lawrence A. Schott, 15940 Warwick Rd., Detroit, Mich. 48239

Filed May 7, 1984, Ser. No. 607,569
Int. Cl.[4] F24H *3/12*
U.S. Cl. 126—117 **1 Claim**



1. A heating furnace assembly for a fluid medium which comprises:

(a) a vertical burner chamber,

(b) a combustion burner at the base of said burner chamber,

(c) insulated means forming an annular counterflow heat exchange chamber around said vertical burner chamber, and

(d) heat conductive means within said annular counterflow heat exchange chamber to carry fluid to be heated upwardly within said heat exchange chamber to a suitable outlet for utilization, and to carry combustion gases from said burner chamber downward to an exhaust path, whereby heat from said combustion gases will transfer to said fluid to be heated in said counterflow,

(e) a base on said assembly comprising a plurality of vertically stacked manifold chambers in heat exchange relationship comprising a combustion air chamber connected to said burner, a fluid inlet chamber connected to said heat exchange chamber for fluid to be heated, and a chamber to receive combustion exhaust gases from said heat exchange chamber, said chamber to receive combustion exhaust gases being interposed between said combustion air chamber and said fluid inlet chamber.

4,587,950

HEAT PACK APPARATUS

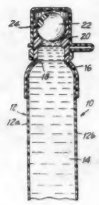
William Mack, Commack, N.Y., and Gary G. Matison, Wilton, Conn., assignors to Clairol Incorporated, New York, N.Y.

Filed Dec. 31, 1984, Ser. No. 687,614
Int. Cl.[4] F24J *1/00*
U.S. Cl. 126—263 **2 Claims**

1. In an apparatus suitable for the storage and release of thermal energy in the form of heat of fusion of a salt hydrate comprising a flexible, salt hydrate impervious container, and a solution of salt hydrate and water in the container, the improvement comprising:

a rotatable ball constructed of a material non-reactive with salt hydrates and having a textured surface on one hemisphere thereof and a smooth surface on the other hemisphere thereof;

support means in the surface of said container for rotatably and substantially sealingly supporting said rotatable ball in such a manner that a portion of said rotatable ball is exposed to the interior of said container and a portion thereof is simultaneously exposed to the exterior of said



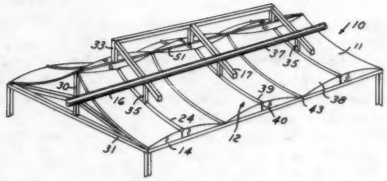
container whereby, upon rotation of said ball, said textured and smooth surfaces may be alternately exposed to the exterior of said container in order to induce crystallization of said solution.

4,587,951

CIRCULAR ARC SOLAR CONCENTRATOR

Donald W. Townsend, and Edward E. Routery, both of Phoenix, Ariz., assignors to Stellar Energy Systems, Inc., Phoenix, Ariz.

Division of Ser. No. 486,314, Apr. 19, 1983, Pat. No. 4,538,886.
This application Feb. 27, 1985, Ser. No. 706,435
Int. Cl.[4] F24J *3/02*; G02B *5/10*
U.S. Cl. 126—438 **2 Claims**



1. A roof structure for a building comprising:

a plurality of anticlastic panels having a light concentrating surface being convex along an east-west axis and concave along a north-south axis so that light from a distant source is focused in a narrow and substantially straight zone of concentration that moves in a planar path regardless of the angle of incidence of light directed thereto;

means for securing said panels together on adjacent edges;

a frame for supporting said panels in a stationary position on a building;

a collector means for absorbing the light and converting the light into heat and transferring the heat to a remote location, said collector means moving in the planar path of the zone of concentration according to changes in the location of the zone of concentration; and,

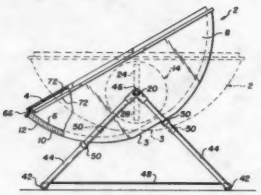
said concave surface includes a crown being a generally circular arc of radius r_{xc}, first and second concave edges being concave generally circular arcs parallel to the crown arc and having a radius r_{xe} which is greater than r_{xc} and first and second intermediate surfaces extending between said first and second concave edges and the crown wherein said intermediate surfaces are defined by generally circular arcs varying in a monotonic increase from the crown to the first and second concave edges.

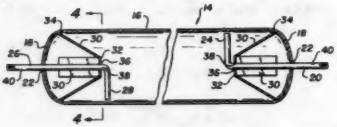
4,587,952

PASSIVE SOLAR WATER HEATER

John L. Richardson, 1978 West 33rd Ave., Vancouver, British Columbia, Canada V6P 1B5

Filed May 10, 1985, Ser. No. 733,275
Int. Cl.[4] F24J 2/56
U.S. Cl. 126—450 9 Claims





1. A passive solar water heater comprising a collector enclosure having a transparent upper surface and a curved, reflective inner surface and end walls;

a storage tank within the collector enclosure positioned to be heated by the sun's rays both directly and reflected from the inner surface of the collector enclosure, and having a cylindrical wall and opposed end walls;

a first pipe extending through and attached to one end wall along the longitudinal axis of the storage tank and extending to a first position, adjacent the cylindrical wall, inside the storage tank;

a second pipe extending through and attached to the other end wall along the longitudinal axis of the storage tank and extending to a second position in the storage tank, adjacent the cylindrical wall;

said first and second positions being generally diametrically opposed to each other;

the first and second pipes extending through the end walls of the collector enclosure to support the storage tank within the collector enclosure;

first releasable means to fix the relative positions of the collector enclosure and the storage tank as desired;

a support frame for the heater and carrying the first and second pipes; and

second releasable means on the support frame to allow variation and fixing of the angle of the collector enclosure without rotating the storage tank from its desired position.

4,587,953

SWEETENER SOLUTION PURIFICATION PROCESS

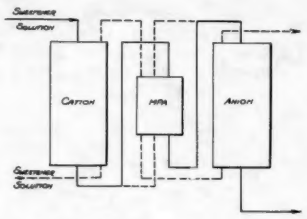
Michael R. Rosene, Pittsburgh, Pa., assignor to Calgon Carbon Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 441,458, Nov. 15, 1982, abandoned, which is a continuation-in-part of Ser. No. 393,211, Jun. 28, 1982, abandoned. This application Sep. 4, 1984, Ser. No. 647,002
Int. Cl.[4] C13D 3/14
U.S. Cl. 127—46.2 14 Claims

1. A fructose syrup purification process consisting essentially of:

(a) passing fructose syrup through a bed containing a cation exchange resin, wherein the effluent from said cation exchange resin bed has a pH of from 2.0 to 2.5;

(b) passing the effluent of said cation exchange resin through a bed containing activated carbon, thereby adsorbing weak organic acids and other fructose syrup impurities; and



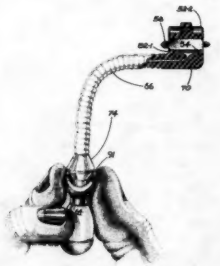
(c) passing the effluent from said activated carbon bed through a bed containing an anion or a mixed cation-anion exchange resin.

4,587,954

ELASTOMERIC PROSTHETIC SPHINCTER

Terry M. Haber, Lake Forest, Calif., assignor to Habley Medical Technology Corporation, Laguna Hills, Calif.

Continuation-in-part of Ser. No. 566,486, Dec. 29, 1983, Pat. No. 4,552,128. This application Jan. 27, 1984, Ser. No. 574,596
Int. Cl.[4] A61B 19/00
U.S. Cl. 128—1 R 10 Claims



1. A sphincter comprising a prosthetic device suitable for implantation so as to embrace a patient's lumen for occluding and opening the lumen and controlling the movement of material therethrough, said sphincter further comprising:

articulating structure means including an occlusion orifice for surrounding the lumen, at least some of said articulating structure means having a chamber adapted to receive therewithin a pressure transmitting medium for causing said occlusion orifice to close the lumen and inhibit material movement therethrough,

reservoir means having a supply of pressure transmitting medium therein,

channel means extending between said reservoir means and the chamber of said articulating structure means to permit the pressure transmitting medium to flow therebetween, and

normally closed valve means located in said channel means for controlling the passage of pressure transmitting medium between said reservoir means and said articulating structure means, said valve means including at least two arcuate flow control appendages, each of said appendages terminating at an upwardly projecting portion extending within said channel means in a forward direction towards said articulating structure means, said arcuate appendages engaging one another and thereby forming a concave closure across said channel means to prevent the passage of pressure transmitting medium through said valve means in a backward direction towards said reservoir means, and an extensible force transmitting body located between said

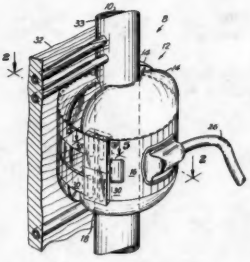
reservoir means and the interface of said arcuate appendages to receive therein pressure transmitting medium from said reservoir means and thereby cause a separation of said flow control appendages to permit the passage of pressure transmitting medium to said chamber in the forward direction through said valve means.

4,587,955

LATCH FOR SECURING AN ARTIFICIAL SPHINCTER

Jeffrey R. Gengler, Milwaukee, Wis., assignor to Medical Engineering Corporation, Racine, Wis.

Filed Oct. 22, 1984, Ser. No. 663,287
Int. Cl.[4] A61B *19/00*; A61F *1/00*
U.S. Cl. 128—1 R **8 Claims**



1. A latch for securing the ends of a belt together so as to encircle an inflatable cuff of an artificial sphincter, said latch comprising:

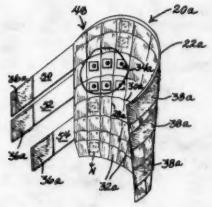
two components mounted on a common pin, at least one of said components being at least partly rotatable about said pin relative to said other component, each of said components including at least one cavity for receipt of a portion of the belt end, said cavities being accessible for insertion or removal of said belt portion upon suitable rotation of at least one of said components, said inserted belt ends being captured within said cavities when said two components are in a rotatably stabilized condition.

4,587,956

REVERSIBLE MAGNETIC THERAPEUTIC DEVICE AND METHOD OF USE

William D. Griffin, Rte. 2, Box 53A, Brimfield, Ill. 61517, and William D. Griffin, II, 3107 W. Willow Knolls Dr., Peoria, Ill. 61614

Filed Sep. 13, 1984, Ser. No. 650,248
Int. Cl.[4] A61B *17/52*
U.S. Cl. 128—1.3 **10 Claims**



1. A reversible magnetic therapeutic device for enclosing an animal or human ailing body part to direct a therapeutically effective uniform magnetic flux of selected exclusively north or south pole polarity into the body part from all radial directions completely around the periphery thereof comprising:

a two-sided flexible wrapper sized to enclose the body part in either of two sleeve-like optional configurations with one or the other side of the wrapper engaging the body part;

reversible connecting means along opposite edges of the wrapper effective to hold said wrapper as a sleeve or tube conforming to the body part in either of said optional sleeve-like configurations; and

a plurality of magnets supported in the wrapper sufficiently sized and disposed in rows and columns completely across both the height and width thereof between said opposite edges, to provide a therapeutically effective, two-dimensional magnetic array with the north-south axes of the magnets oriented substantially perpendicularly to the plane of the wrapper and with all the north poles on one side of the wrapper and all the south poles on the other side;

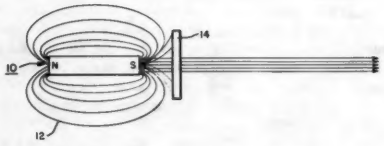
whereby a selected high uniform, therapeutically effective north or south pole flux can be directed radially into the ailing body part completely around the periphery thereof by applying the wrapper about the body part with the north or south poles of the magnets selectively facing inwardly toward the body part completely around the body part and extending beyond the ailing portion thereof at both ends of the sleeve or tube.

4,587,957

TISSUE AND BONE REGENERATION

John C. Castel, Lake Forest, Ill., assignor to Physio Technology, Inc., Topeka, Kans.

Continuation-in-part of Ser. No. 294,714, Aug. 20, 1981. This application Sep. 23, 1982, Ser. No. 422,306
Int. Cl.[4] A61N *1/42*
U.S. Cl. 128—1.3 **10 Claims**



1. An apparatus for treating tissue comprising:

means for producing a magnetic field to be directed an area, a portion of which is defined by the surface of tissue to be treated; and

blocking means comprising a pair of facially juxtaposed polarizing filter sheets, one of said sheets having a flux-passing aperture therein, said sheets being arranged at a preselected angle of polarization relative to each other to block transmission of the flux through overlapping areas thereof, thereby to controlledly pass through said aperture only magnetic flux from said means for producing the magnetic field and arranged to be facially abutted to an area including said surface of the tissue to be treated.

4,587,958

ULTRASONIC SURGICAL DEVICE

Yasuo Noguchi, Yokohama, and Masaru Shibata, Kanagawa, both of Japan, assignors to Sumitomo Bakelite Company Limited, Tokyo, Japan

PCT No. PCT/JP83/00106, § 371 Date Jun. 5, 1984, § 102(e) Date Jun. 5, 1984, PCT Pub. No. WO84/03828, PCT Pub. Date Oct. 11, 1984
PCT Filed Apr. 4, 1983, Ser. No. 618,398
Int. Cl.[4] A61H *1/00*
U.S. Cl. 128—24 A **9 Claims**

1. An ultrasonic surgical device having an ultrasonic oscilla-

tion circuit and an ultrasonic transducer with an electrostriction type vibrator, said oscillation circuit comprising:

power supply means including a rectifier circuit means for converting AC current from an AC power source into DC current,

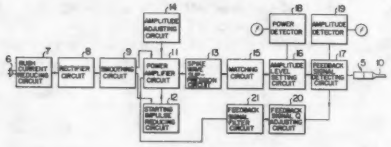
means for connecting said AC power source and said rectifier circuit means to reduce rush current from said AC power source to said rectifier circuit means;

a smoothing circuit means connected to said rectifier circuit means for reducing ripples of the DC current;

a power amplifier circuit means connected to said smoothing circuit means to produce an amplified electric signal,

means connected to said amplifier circuits means for suppressing spike wave of the amplified electric signal,

matching-circuit means connected to said spike-suppressing means for supplying an electric signal of a reduced loss to said ultrasonic transducer in response to load increase thereof,



means connected to said matching-circuit means for setting an amplitude level of the supplied electric signal to stably operate said transducer with a low loss,

means for connecting said amplitude-level setting means and said transducer to drive said transducer and produce a feedback signal,

means for feeding back the feedback signal to said power amplifier circuit means, said feedback means including quality-factor adjusting means and feedback signal filtering means for filtering out spurious frequency signals,

means connected to said power amplifier circuit means to adjust the amplitude of said amplified electric signal, and

starting-impulse reducing means connected between said smoothing circuit means and said power amplifier circuit means to reduce the impulse of the DC current to the latter at start of oscillation.

4,587,959

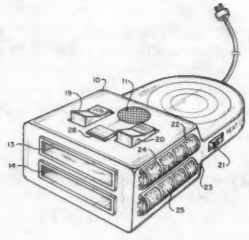
HOT AND COLD THERAPEUTIC APPLICATOR

Max J. Ruderian, 545 Hanley Ave., Los Angeles, Calif. 90049

Filed Apr. 2, 1985, Ser. No. 719,063

Int. Cl.[4] A61F *7/00;* **A61M** *37/00*

U.S. Cl. 128—24.1 **7 Claims**



1. A hot and cold therapeutic applicator including, in combination:

(a) a casing having air entrance opening means and first and second air exit passages;

(b) a partition in the interior of said casing separating said first and second air exit passages;

(c) first and second blowers for directing incoming air along said first and second air exit passages respectively;

(d) air heating means only in said first passage; and

(e) first and second switches for respectively operating said first and second blowers whereby hot air only can be expelled from said first passage; cool air only can be expelled from said second passage; and hot and cool air can be simultaneously respectively expelled from said first and second passages.

4,587,960

PASSIVE LEG EXERCISE APPARATUS

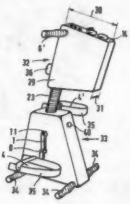
Theodor Schotten, Grevenbroich, Fed. Rep. of Germany, assignor to Firma Neubauer GmbH, Mashinenbau, Neuss, Fed. Rep. of Germany

Filed Jun. 9, 1983, Ser. No. 502,707

Claims priority, application European Pat. Off., Jun. 10, 1982, 82105086.1

Int. Cl.[4] A63B *69/16;* **A61H** *1/02*

U.S. Cl. 128—25 R **12 Claims**



1. A passive leg-exercise apparatus comprising:

a lower body section comprising:

a floor stand,

a pedal bearing means supported on said floor stand,

a pedal crank rotatably mounted in said pedal bearing means and extending outwardly beyond the ends thereof,

a pedal pivotally mounted on each outer end of said pedal crank so that the pivot axis of each pedal is always above the pedal in use,

a drive motor supported on said floor, and

means to operatively connect said drive motor to said pedal crank to rotatably drive said pedal crank;

a tubular support mounted on said floor stand extending upwardly therefrom at an inclined angle;

an independent upper body section supported on the upper portion of said tubular support in spaced relationship above said lower body section comprising:

smooth side panels extending in spaced substantially vertical planes,

a top plate closing the top of said upper body section,

manual control means mounted on said top plate operatively connected to said drive motor for controlling the operation thereof,

a handlebar projecting through said side panels,

handle grips on the outer ends of said handlebar disposed above said pedal bearing means,

the horizontal length of said side panels being substantially greater than the spacing between said side panels and said side panels being arranged with respect to said pedals so that in use said upper body section separates the knees of a user when the feet of the user are in said pedals;

means to pivotally move said upper body section about a horizontal transverse axis relative to said lower body section; and

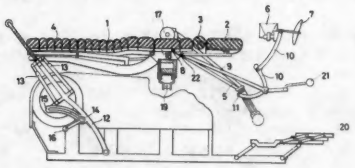
means to lock said upper body section in position.

4,587,961

ELECTROMECHANIC APPARATUS FOR CARRYING OUT PROGRAMMED PASSIVE GYMNASTICS

Angelo Ventura, and Luciano Ventura, both of Torno, Italy, assignors to Ofmec Officine Meccaniche Mantovane S.p.A., Mantova, Italy

Continuation-in-part of Ser. No. 382,140, May 26, 1982, abandoned. This application Feb. 16, 1984, Ser. No. 579,798
Claims priority, application Italy, Jun. 4, 1981, 22137 A/81
Int. Cl.[4] A61H *1/02*
U.S. Cl. 128—25 R **9 Claims**



1. A passive gymnastics programmed apparatus, comprising an articulated bed formed by articulated orientable sections;
adjustable means mounted on said bed for releasably affixing a user's legs thereto and permitting the user's feet to rest thereon;
linkage means coupled to said adjustable means for selectively independently moving the legs of said user in a selected one of an extended condition and a retracted condition, said linkage means selectively moving the right leg of said user, the left leg of said user and both legs of said user independently, selectively rotating and bending both legs of said user, the right leg of said user and the left leg of said user, selectively flexing the back of said user, selectively bending the back of said user and the left leg of said user, the back and the right leg of said user and the back and both legs of said user, selectively flexing the back and legs of said user, selectively bending the back and right leg of said user, the back and left leg of said user and the back and both legs of said user, and selectively abducting and adducting the legs of said user;
a cylindrical member pivotally mounted on said bed independently of said linkage means and positionable relative to the plane of said bed for raising the knees of said user and supporting said knees only at the commencement of bending movement of said legs;
additional linkage means for selectively independently moving the arms of said user in a supine position;
driving means including rod-crank-cam assemblies for moving said bed and said orientable sections thereof via said rod-crank-cam assemblies; and
set screws and handles coupled to said linkage means for manually selectively providing abduction and adduction movements of the legs of said user in a supine position and adjusting the amplitude of said movements.

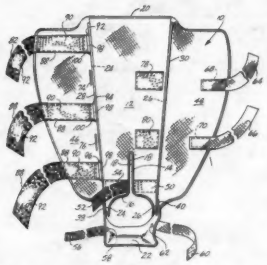
4,587,962

TIBIA/ANKLE ORTHOSIS

Ted J. Greene, La Canada, and Matthew V. Waidelich, Monrovia, both of Calif., assignors to United States Manufacturing Company, Pasadena, Calif.

Filed Feb. 8, 1984, Ser. No. 578,230
Int. Cl.[4] A61F *5/00*
U.S. Cl. 128—80 H **15 Claims**

1. A tibia/ankle orthosis comprising a flexible jacket shaped to fit around the lower leg of a patient, the jacket having a continuous front section for extending along the front of the tibia and across the width of the tibia, a pair of more rigid uprights on opposite sides of the front section for extending along lateral and medial sides of the tibia, the jacket terminating in lateral and medial flaps that overlap one another at the rear of the tibia, a footplate rotatably secured to lower portions of the uprights for supporting the foot while the jacket is wrapped around the tibia, a narrow upright slotted opening extending along the lower portion of the jacket front section immediately above the footplate for being opened to permit the



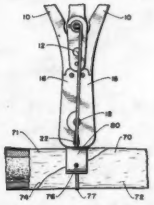
patient's foot to be placed on the footplate without significant front-to-rear rotation of the foot about the ankle joint while placing the jacket around the tibia from front to rear, and means carried on the jacket for tightly wrapping the jacket around the tibia after the foot is supported on the footplate.

4,587,963

INSTRUMENT FOR POSITIONING A CERCLAGE FIXATION DEVICE AROUND FRACTURED BONE PARTS

Karl Leibinger, and Franz Leibinger, both of Josef-Lang. Str. 22, 7202 Mulheim 2, Fed. Rep. of Germany

Filed May 22, 1984, Ser. No. 613,030
Claims priority, application Fed. Rep. of Germany, May 26, 1983, 3319149
Int. Cl.[4] A61F *5/04*
U.S. Cl. 128—92 B **15 Claims**



1. In an instrument for the mutual positioning and fixtation of adjacent bone parts by means of a wire which holds the bone parts together by a tractive force, said wire being threaded through boreholes in a plate disposed in contiguity to said bone parts, said boreholes having a diameter which is only slightly larger than the diameter of said wire, the combination of: deformation means on said instrument engageable with one end of said wire for deforming the cross section of said wire sufficiently to prevent said one end from being pulled through the associated borehole; and traction means on said instrument engageable with the other end of said wire after it has been threaded through the other of said boreholes to impose a tractive load on said wire, said deformation means being operable on the other end of said wire immediately adjacent said other borehole to deform the cross section of said wire and to prevent said other end of said wire from being pulled through its borehole and thereby to maintain the tractive load of said wire against the mutually positioned bone parts.

4,587,964

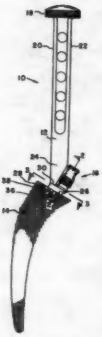
RASP TOOL

Charles B. Walker; Roy Y. Hori, and Michael B. Butler, all of Warsaw, Ind., assignors to Zimmer, Inc., Warsaw, Ind.

Filed Feb. 5, 1985, Ser. No. 698,464

Int. Cl.[4] A61F *5/04*

U.S. Cl. 128—92 E 14 Claims



1. A rasp tool for contouring a bone or the like comprising a handle with a head at one end and a releasable locking assembly at the other end, a cutter cooperating with the releasable locking assembly and adapted to contour the bone, the other end including a transversely extending flange defining a pair of oppositely facing surfaces, the cutter engaging one of the surfaces when cooperating with the releasable locking assembly and the releasable locking assembly extending away from the other surface and defining a length which is substantially less than a length for the handle, the flange defining an aperture for receiving a portion of the cutter and the portion extends into the releasable locking assembly to cooperate therewith, and the releasable locking assembly is carried by the flange on one side of the latter to remain spaced from all of the cutter except for that portion of the cutter extending into the aperture.

4,587,965

EAR PROTECTOR FOR KEEPING DOWN SOUND AND ASSOCIATED FILTER

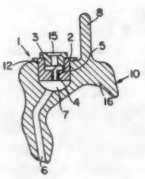
Berend de Boer, Schweitzerlaan 32, 5644 DL Eindhoven, Netherlands 5644 DL, and Karel J. Doorduin, Heuvelstraat, Dongen, Netherlands 5101 TC

Filed Dec. 23, 1983, Ser. No. 564,676

Claims priority, application Netherlands, Dec. 24, 1982, 8204984

Int. Cl.[4] A61F *11/02*

U.S. Cl. 128—152 12 Claims



1. An ear protector for insertion in the concha of an ear comprising:

a protector body sized to fit securely within the concha and having a duct therethrough for permitting transmission of sound through the body;

a filter within a portion of the duct for reducing the sound transmission through the duct wherein the filter has a bore therethrough;

an elongated member within at least a portion of the filter bore for further reducing sound transmission through the duct.

4,587,966

DEVICE FOR EVALUATING THE MIXING OF LIQUID ANESTHETIC AND A RESPIRATORY GAS FOR PATIENTS

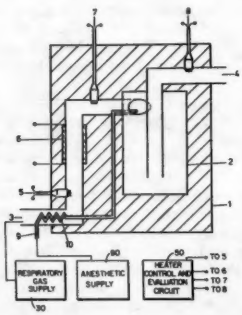
Scato Albarda, Gross Schenkenberg, Fed. Rep. of Germany, assignor to Drägerwerk Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 13, 1983, Ser. No. 531,689

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1982, 3234474

Int. Cl.[4] A61M *16/00*

U.S. Cl. 128—202.22 2 Claims

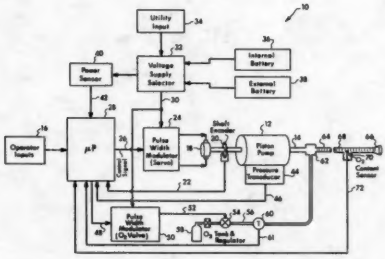


1. An evaluation device, comprising a housing having a mixing chamber therein, a respiratory gas supply external to said housing, an inlet conduit for respiratory gas having an entrance and being connected to the respiratory gas supply and extending into said housing and into said mixing chamber, an anesthetic supply external to said housing, an anesthetic conduit connected to said anesthetic supply and having a heat exchanger portion in said inlet conduit adjacent said entrance of said inlet conduit, said anesthetic conduit extending through said housing from said heat exchanger portion into said mixing chamber along a path different from said inlet conduit, said inlet conduit being connected into said mixing chamber so as to direct respiratory gas tangentially into said mixing chamber to form a cyclonic pool in said mixing chamber, said anesthetic conduit being connected into said mixing chamber so as to direct anesthetic gas into the formed cyclonic pool in such a manner as to cause evaporation of anesthetic in said mixing chamber, a heater located in said housing adjacent said inlet conduit downstream of said heat exchanger portion for heating said inlet conduit, an inlet temperature sensor in said inlet conduit between said heat exchanger and said heater, an intermediate temperature sensor in said inlet conduit between said heater and said mixing chamber, an outlet conduit extending from said mixing chamber through said housing to the exterior thereof, said housing having means for insulating said inlet, anesthetic and outlet conduits from the exterior, a discharge temperature sensor in said outlet conduit for sensing the temperature of the mixture of evaporated anesthetic and the respiratory gas located in said outlet conduit, and electrical evaluation means connected to each of said inlet temperature sensor, said discharge temperature sensor and said heater for regulating said heater based on temperatures sensed by said inlet and discharge temperature sensors.

4,587,967
OXYGEN ENRICHED RECIPROCATING PISTON RESPIRATOR

Raymond D. Chu, Boulder; Anthony C. Rubner, Arvada, and Marc A. Bergman, Lafayette, all of Colo., assignors to Lifecare Services, Inc., Boulder, Colo.

Filed Jul. 9, 1985, Ser. No. 753,334
Int. Cl.[4] A61M *16/00*
U.S. Cl. 128—204.21 17 Claims



1. A variable flow reciprocating piston respirator system which is capable of providing a substantially constant supply gas enrichment of a reciprocating piston gas produced by said reciprocating piston respirator throughout an inspiratory stroke of said reciprocating piston respirator comprising:

reciprocating piston respirator means for producing a variable flow output of said reciprocating piston gas;

supply gas reservoir means for providing a source of said supply gas to be admixed with said reciprocating piston gas;

control valve means for regulating flow of said supply gas from said supply gas reservoir means;

means for combining said flow of said supply gas from said control valve means with said variable flow output of said reciprocating piston gas downstream from said reciprocating piston respirator means; and,

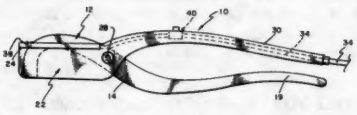
airway means for inducing turbulence sufficient to substantially mix said supply gas with said variable flow output of said reciprocating piston gas from said reciprocating piston respirator means;

logic means for generating a control signal for regulating said control valve means such that said flow of said supply gas from said control valve means produces said substantially constant supply gas enrichments.

4,587,968
ELECTRIC EMASCULATOR AND METHOD FOR CASTRATING

David R. Price, Alden, Kans. 67512

Filed Mar. 19, 1984, Ser. No. 591,064
Int. Cl.[4] A61B *17/32, 17/38*
U.S. Cl. 128—303.1 2 Claims



1. An electric emasculator for castrating a bull calf or the like comprising

a first scissor member having a first shank and terminating at one end into a first structure dfining an essentially arcuate-L shaped hook including a first cutting edge means in order to hook the scrotum of the bull calf or the like and assist in the severing operation;

a second scissor member pivotally secured to said first scissor member and terminating at one end into a second structure defining a bifurcated fork with a pair of parallel upper edges and a bifurcated second shank, said first shank of said first scissor member pivotally lodges within said bifurcated second shank as said arcuate-L shaped hook including said first cutting edge means scissors through the bifurcated opening between the bifurcated fork;

one of said parallel upper edges has a structure defining a second cutting edge means;

a heating element means positioned entirely along the other parallel upper edge to cauterize as an incident to the severing operation and assist in blood coagulation to prevent the flow of blood and closure of blood vessels in the area of amputation;

an electric conductor means engaged to a power source for conducting electricity to the heating element means; said second scissor member having a structure defining a generally longitudinal conduit wherethrough said electric conductor means lodges in its connection path to the heating element means;

said first scissor member additionally comprises a crushing block means integrally bound to said essentially arcuate-L shaped hook which stops or limits the downward cutting movement of the first cutting edge means of the first scissor member between the bifurcated fork;

a switch means situated on said second scissor member for releasing power to the heating element means;

a bolt means piercing the first and second shank to pivotally bound the first scissor member and second scissor member together;

said crushing block means is bound to said essentially arcuate-L shaped hook at a point on same such that the end of the first structure registers with the bottom of said second structure;

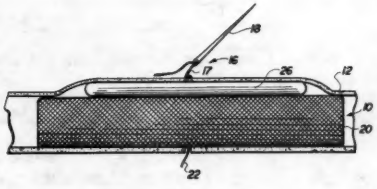
said first scissor member and said second scissor member each terminate at the other end into a first handle and a second handle respectively; and

said second handle includes said longitudinal conduit structure and terminates at a point where said electric conductor means enters into said longitudinal conduit structure, said first cutting edge means and said second cutting edge means slidably contact each other when said emasculator is in a closed docking posture.

4,587,969
SUPPORT ASSEMBLY FOR A BLOOD VESSEL OR LIKE ORGAN

Rolando Gillis, 10725 Westwood Lake Dr., Miami, Fla. 33165

Filed Jan. 28, 1985, Ser. No. 695,791
Int. Cl.[4] A61B *17/11*
U.S. Cl. 128—334 R 10 Claims



1. A support assembly for a blood vessel or like hollow, tubular organ having an opening therein and primarily designed for placement within the vessel during closing of the opening, said assembly comprising:

(a) a roll formed from a length of strand wound upon itself to form windings, said windings collectively defining the configuration of said roll,

(b) said roll dimensioned and configured to define an outer

surface disposable in supporting engagement with an inner surface of the vessel,

(c) a pigtail defined by a distal extremity of said length of strand and disposed to extend outwardly from said roll through the vessel and exteriorly thereof,

(d) a roller having an elongated configuration disposable on the interior of the vessel between said outer surface of said roll and an inner surface of the vessel,

(e) said roller movable along said outer surface in a substantially circular path of travel about the outer circumference of said roll and movably disposed along said path of travel in continuous, supporting relation to the inner surface of the vessel,

(f) said roll and said roller relatively dimensioned and disposed to define an operative space therebetween, said operative space movable along with said roll, circumferentially about said roll and in contiguous, communicating relation to the opening in the vessel, whereby the opening in the vessel is closed through utilization of said space and support of peripheral portion of the opening by said roll and roller;

(g) said roller longitudinally slidable through a first unclosed portion of the opening and said roll passable through a second unclosed portion of the opening upon becoming unrolled upon application of pulling tension to the pigtail,

(h) whereby both said roll and said roller are independently removable from the vessel subsequent to closure of all but the first and the second unclosed portions of the opening.

4,587,970

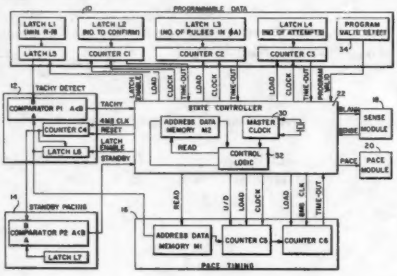
TACHYCARDIA REVERSION PACER

Loraine K. Holley, Rockdale, and Robert Evans, Chatswood, both of Australia, assignors to Telectronics N.V., Curacao, Netherlands Antilles

Filed Jan. 22, 1985, Ser. No. 693,592

Int. Cl.[4] A61A *1/36*

U.S. Cl. 128—419 PG **122 Claims**



1. A method of operating a tachycardia control pacer comprising the steps of:

(a) sensing and monitoring the rate of successive patient heartbeats to confirm the existence of a tachycardia episode,

(b) determining a pacing interval as a predetermined function of the rate at which the patient heartbeats are occurring, said predetermined function being based upon the physiological relationship of effective refractory period and tachycardia rate, and

(c) generating a sequence of pacing pulses at intervals equal to said pacing interval in order to terminate said tachycardia episode, with the first pacing pulse of said sequence being generated following the last heartbeat used to confirm the tachycardia episode after the elapse of an interval which is equal to said pacing interval.

4,587,971

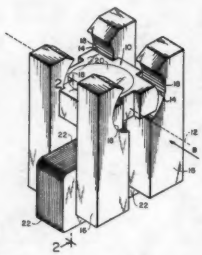
ULTRASONIC SCANNING APPARATUS

Fred R. Stolfi, Shrub Oak; Robert L. Maresca, Ossining, and Peter P. Adamovic, Irvington, all of N.Y., assignors to North American Philips Corporation, New York, N.Y.

Filed Nov. 29, 1984, Ser. No. 676,461

Int. Cl.[4] A61B *10/00*

U.S. Cl. 128—660 **7 Claims**



1. An ultrasonic scanning apparatus comprising:

a rotor having a positive magnetic susceptibility, said rotor being arranged to rotate about an axis of rotation, said rotor having first and second pole faces on a first side of the axis of the rotation, said first and second pole faces being spaced axially along the axis of rotation, said rotor having third and fourth pole faces on a second side of the axis of rotation opposite the first side, said third and fourth pole faces being spaced axially along the axis of rotation, said pole faces oriented away from the axis of the rotation;

a first electromagnetic stator means arranged on the first side of the axis of rotation, said first stator means having two curved pole faces arranged opposite the first and second rotor pole faces and separated therefrom by gaps, said first stator means pole faces being tapered such that on rotation of the rotor in a first direction from a first position to a second position, the gaps between the first stator means pole faces and the first and second rotor pole faces decrease, said first stator means and said rotor forming a first magnetic circuit whose major reluctance is in the gaps;

a second electromagnetic stator means arranged on the second side of the axis of rotation, said second stator means having two curved pole faces arranged opposite the third and fourth rotor pole faces and separated therefrom by gaps, said second stator means pole faces being tapered such that on rotation of the rotor in a second direction, opposite the first direction, from the second position to the first position, the gaps between the second stator means pole faces and the third and fourth rotor pole faces decrease, said second stator means and said rotor forming a second magnetic circuit whose major reluctance is in the gaps;

an ultrasonic transducer mounted on the rotor; and

means for alternately energizing the first and second electromagnetic stator means to cause the rotor to oscillate about the axis of rotation.

4,587,972

DEVICE FOR DIAGNOSTIC AND THERAPEUTIC INTRAVASCULAR INTERVENTION

Bernardo D. Morantte, Jr., 6713 Woodhaven Pl., Riverbank, Calif. 95367

Filed Jul. 16, 1984, Ser. No. 631,381

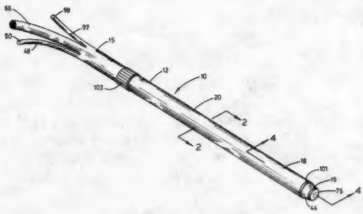
Int. Cl.[4] A61B *8/12, 17/36*

U.S. Cl. 128—660 **24 Claims**

1. A device permitting imaging and removing obstructions from blood vessels and the like of a patient, the device comprising,

a flexible housing dimensioned for insertion within a blood vessel;

laser means borne by the housing for transmitting laser energy externally of the housing to an obstruction in said blood vessel to destroy a portion of the obstruction; and



ultrasound means borne by the housing for generating ultrasonic waves and having a piezoelectric portion adapted to generate electric signals, upon contact by ultrasonic waves echoed from a solid object, for analysis externally of the patient to create an image of the solid object.

4,587,973

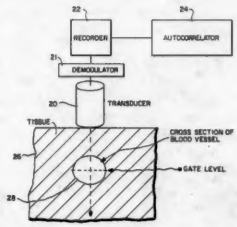
ULTRASONIC METHOD AND MEANS FOR MEASURING BLOOD FLOW AND THE LIKE USING AUTOCORRELATION

Stephen W. Flax, Waukesha, Wis., assignor to General Electric Company, Milwaukee, Wis.

Continuation of Ser. No. 520,959, Aug. 8, 1983, abandoned. This application Jul. 10, 1985, Ser. No. 754,193

Int. Cl.[4] A61B *10/00*

U.S. Cl. 128—663 **4 Claims**



4. Apparatus for use in measuring flow of a fluid such as blood and based on changes in textural pattern of reflected ultrasonic wave comprising

an ultrasonic transducer for transmitting ultrasonic waves perpendicularly into said flow of fluid, receiving ultrasonic signals reflected by said fluid, and producing electrical signals indicative of said received ultrasonic signals,

means for detecting textural pattern signals from said electrical signals,

means for recording said textural pattern signals, and

means for autocorrelating the recorded textural pattern signals thereby indicating change in textural patterns as function of time at a given position as a measure of said fluid flow.

4,587,974

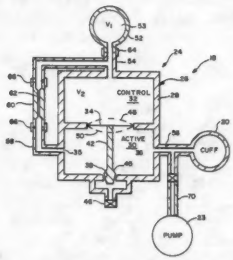
LINEAR PRESSURIZING AND DEPRESSURIZING DEVICE

William T. Link, Berkeley, Calif., assignor to Norse Instruments, Hayward, Calif.

Filed Nov. 13, 1984, Ser. No. 670,213

Int. Cl.[4] A61B *5/02*

U.S. Cl. 128—685 **12 Claims**



1. In an arrangement for taking blood pressure in which a cuff wrapped around a body part of a patient is first pressurized to a given level and then depressurized sufficient to detect the patient's systolic and diastolic pressures, the improvement comprising means acting on said cuff after the latter has been pressurized to said given level for causing it to depressurize in a substantially linear way independent of the pressurized volume of the cuff, said depressurizing means including; a housing defining adjacent internal active and control pressure chambers separated from one another in an air sealed manner by a diaphragm; first means for placing said active and control chambers and said cuff in air-flow communication with one another whereby all three thereof are initially pressurized to said given level; and second means cooperating with said diaphragm for placing said active chamber in air-flow communication with the ambient surroundings only as long as the pressure within said control chamber is at most greater than the pressure in said active chamber by a particular relatively small amount, said second means closing the air flow communication between said active chamber and ambient surroundings if the pressure within said control chamber is greater than the pressure with said active chamber by more than said particular amount.

4,587,975

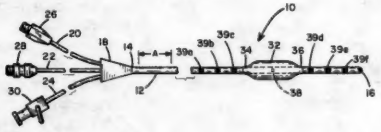
DIMENSION SENSITIVE ANGIOPLASTY CATHETER

Rodney W. Salo, Columbia Heights, and Brian D. Pederson, St. Paul, both of Minn., assignors to Cardiac Pacemakers, Inc., St. Paul, Minn.

Filed Jul. 2, 1984, Ser. No. 626,719

Int. Cl.[4] A61B *5/02*

U.S. Cl. 128—693 **8 Claims**



1. Angioplasty catheter having means for indicating blood vessel wall dimensions comprising, in combination:

(a) an elongated tubular body having a longitudinally extending lumen and a proximal end and a distal end with an expander member affixed near said distal end, said expander member being in fluid communication with said lumen of said tubular body;

(b) a plurality of electrodes disposed on the surface of said tubular body proximate said expander member;

(c) signal generator means connected to the proximal end of said catheter body for applying an alternating current carrier signal between first and second of said plurality of electrodes, said carrier signal being modulated by the changes in blood flow through said blood vessel; and

(d) signal processing means connected to third and fourth of said plurality of electrodes for developing a direct current signal proportional to the cross-sectional size of a blood vessel in which said distal end of said catheter body is disposed.

4,587,976
METHOD OF, AND APPARATUS FOR, DETERMINING THE STARTING POINT AND THE END POINT OF CLOSED SIGNAL PATTERNS

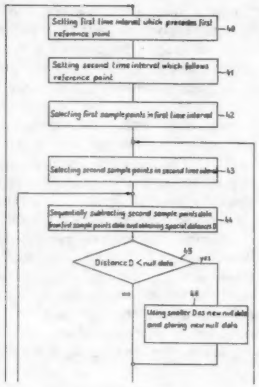
Johann J. Schmid, Buchs, and Werner Thie, Dielsdorf, both of Switzerland, assignors to Willi Studer AG, Fabrik für elektronische Apparate, Regensdorf, Switzerland

Filed Jan. 22, 1985, Ser. No. 693,683

Claims priority, application Switzerland, Jan. 25, 1984, 327/84

Int. Cl.⁴ A61B *5/04*

U.S. Cl. 128—699 **33 Claims**


Setting first time interval which precedes first reference point
Setting second time interval which follows reference point
Selecting first sample points in first time interval
Selecting second sample points in second time interval
Sequentially subtracting second sample points data from first sample point's data and obtaining spacial distances D
Distance D < null data
yes
no
Using smaller Dist new null data and storing new null data

1. A method of determining the starting point and the end point of a spatial closed signal pattern in a time sequence of individual ones of such spatial closed signal patterns, each of which is constituted by a series of measured signals, said method comprising the steps of:

arrangiang a predetermined number of electrodes in a predetermined configuration at a living being to be investigated and receiving said time sequence of spatial closed signal patterns by means of said electrodes;

subdividing a predetermined period of time which is associated with a selected one of said individual spatial closed signal patterns, into a first time interval and a second time interval;

sampling said selected individual spatial closed signal pattern and determining, at each one of a predetermined number of sampling moments associated with said first time period, the distance between a predetermined number of sampling points associated with said predetermined number of sampling moments in said first time interval, on the one hand, and a predetermined number of sampling points associated with a predetermined number of sampling moments in said second time interval, on the other hand;

ascertaining the minimum value of said distances determined between said predetermined sampling points associated with said first time interval and said predetermined sampling points associated with said second time interval; and

defining a selected sampling point associated with said first time interval and a selected sampling point associated with said second time interval, between which said minimum distance exists, as said starting point and as said end point, respectively, of said selected individual spatial closed signal pattern.

4,587,977
MEASURING DEVICE FOR DETERMINING THE LOCATION OF A STYLUS

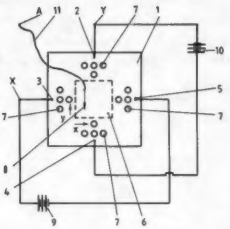
Georg Meyer, Emilienstr. 11, and Heinz dal Ri, Tuckmannweg 2, both of 3400 Göttingen, Fed. Rep. of Germany

Filed Nov. 18, 1983, Ser. No. 553,487

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1982, 3243954

Int. Cl.⁴ A61B *5/10*

U.S. Cl. 128—777 **14 Claims**



1. In an apparatus for measurement of jaw or tempero-mandibular movement, a planar electric measuring apparatus for determining a site whereon a stylus rests comprising: a stylus; an electrically conductive surface positioned below and in contact with said stylus; connection electrodes having contact points applied to said conductive surface, said contact points contacting said surface; said conductive surface having perforations in vicinity of said electrodes for providing said surface with a predetermined electrical field; and means connected between said electrodes and said stylus for determining the position of said system on said conductive surface.

4,587,978
APPARATUS FOR HIGH-FREQUENCY HYPERTHERMIA

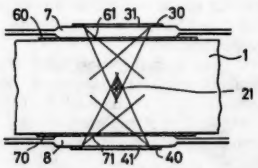
Sumio Suyama, Kojohga-oka 15-25, Ohtsu-shi, Shiga-ken, and Itsuo Yamamoto, Tsutsumi-cho 3-chome 17-10, Yao-shi, Osaka, both of Japan

Filed Oct. 12, 1984, Ser. No. 660,351

Claims priority, application Japan, Oct. 31, 1983, 58-205424

Int. Cl.⁴ A61N *1/06*

U.S. Cl. 128—804 **1 Claim**



1. In an apparatus for high-frequency hyperthermia comprising a pair of electrodes connected to a high-frequency generator to produce a high-frequency field between said electrodes,

and a pair of cooling pads each having opposed surfaces, there being one cooling pad associated with each of said electrodes, said electrodes being positionable on opposite sides of a body having an affected part therein so that the centers of the electrodes and said affected part may be aligned, and said cooling pads being positionable with one surface facing said electrodes and an opposed surface facing said body, the improvement wherein said electrodes are annularly shaped with a round hole therein, said improvement further comprising, a pair of masks made of a tabular material having a property of intercepting high-frequency energy, said masks having annular slits, the outside diameter of said annular slits being smaller than the inside diameter of said annular electrodes, each of said masks being positionable in coaxial alignment with the holes in said electrodes and adjacent the surface of a cooling pad which is opposed to the cooling pad surface facing its associated electrode.

4,587,979

APPARATUS FOR SUPPLYING PARTICULATE MATERIAL TO TOBACCO PROCESSING MACHINES AND THE LIKE

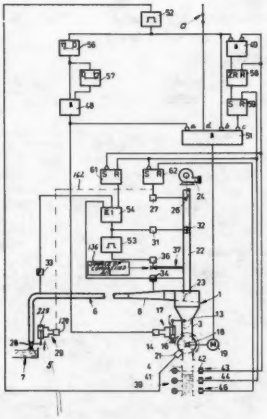
Fritz Hagemann, Hamburg; Hans-Jürgen Block, Wentorf; Gustav Hancke, and Manfred Muss, both of Hamburg, all of Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. KG, Hamburg, Fed. Rep. of Germany

Filed May 21, 1984, Ser. No. 612,148

Claims priority, application Fed. Rep. of Germany, May 19, 1983, 3318235

Int. Cl.[4] A24C *5/39, 5/34, 5/14*

U.S. Cl. 131—110 **25 Claims**



1. Apparatus for supplying particulate materials, such as portions of tobacco leaves, to a consuming machine, such as a cigarette rod making machine, comprising a source of particulate material; a pneumatic conveyor having inlet means adjacent to said source and outlet means; suction generating means connected with said outlet means to draw a stream of air through said conveyor whereby the air stream entrains particulate material from said source; a cyclone separator installed in said conveyor to segregate particulate material from the air stream; evacuating means arranged to receive segregated particulate material from said cyclone separator, said evacuating means comprising a mobile evacuating member; a motor actuatable to move said evacuating member whereby the latter discharges particulate material from said evacuating means; a duct interposed between said separator and said evacuating means and arranged to deliver separated material to said evacuating means by gravity feed; a gate installed in or close to said duct; means for moving said gate between first and second positions in which said gate respectively permits and prevents the descent of separated material into said evacuating means; and means for actuating said moving means so that said gate assumes said second position and prevents entry of particulate material into said evacuating means while said motor moves said evacuating member.

4,587,980

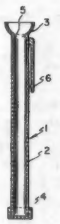
PORTABLE CIGARETTE HOLDER, EXTINGUISHER AND ASHTRAY

Frank Tipper, Richmond, Canada, assignor to Butti Pocket Ashtray Company, Ltd., Surrey, Canada

Filed Jul. 10, 1984, Ser. No. 629,485

Int. Cl.[4] A24F *13/18, 13/20, 19/14*

U.S. Cl. 131—235.1 **5 Claims**



1. A portable cigarette extinguisher-holder-ashtray suitable for being carried in the pocket of a cigarette smoker and capable of receiving the lighted end of a cigarette butt comprising:

(a) a generally enclosed chamber with an opening therein for receiving and holding a cigarette butt, the width of the chamber being slightly larger in size than the diameter of a conventional cigarette, and the width of the chamber gradually increasing in the direction away from the opening; and

(b) a restriction throat, between the chamber and the opening which encircles the sides of the lighted cigarette butt as it is admitted into the chamber and is adapted to smother the lighted end of the cigarette butt by preventing combustion sustaining oxygen from reaching the lighted end of the cigarette.

4,587,981

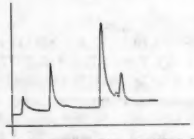
USE OF NORBORNYL PYRIDINE DERIVATIVES IN AUGMENTING OR ENHANCING THE AROMA OF TOBACCO AND IN FLAVORED TOBACCO COMPOSITION

Richard M. Boden, Ocean, and Claude Grim, Keansburg, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 582,756, Feb. 23, 1984, Pat. No. 4,539,143. This application Jun. 7, 1985, Ser. No. 742,326

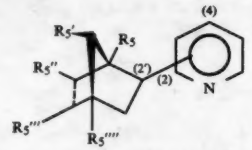
Int. Cl.[4] A24B *15/38*

U.S. Cl. 131—278 **4 Claims**



1. A process for augmenting or enhancing the aroma or taste of a smoking tobacco composition comprising the step of intimately admixing with said smoking tobacco composition an

aroma or taste augmenting or enhancing quantity of at least one compound defined according to the structure:



wherein R_5, R_5', R_5'', R_5''' and R_5'''' represent hydrogen or methyl; wherein the dashed line represents a carbon-carbon single bond or a carbon-carbon double bond; and wherein the norbornyl moiety is bonded to the pyridinyl moiety at the 2' position of the norbornyl moiety and the 2 or the 4 position of the pyridinyl moiety.

4,587,982

TIPPING ASSEMBLY FOR AN ELONGATE SMOKING ARTICLE

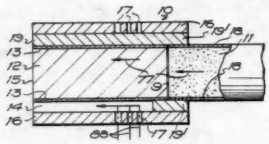
Peter I. Adams, Abbots Leigh; Raymond A. Bryant, Yatton, and William Knapman, Banwell, all of England, assignors to Imperial Group PLC, London, England

Filed Dec. 14, 1982, Ser. No. 449,771

Claims priority, application United Kingdom, Dec. 23, 1981, 8138670

Int. Cl.[4] A24D *3/04, 3/02*

U.S. Cl. 131—336 **15 Claims**



1. A tipping assembly for an elongate smoking article including a rod of smoking material, the assembly comprising,

(a) a cylindrical smoke filter element,

(b) a tipping wrapper surrounding the filter element,

(c) printed raised markings of platics material on the surface of the tipping wrapper facing the filter element, the markings being arranged to define in cooperation with the filter element and the tipping wrapper air channels between the tipping wrapper and the filter element extending to a mouth end of the assembly, said markings being further arranged to define means for blocking off those ends of the channels distal to the mouth end of the assembly, the mouth end of the channels being open to the user, and,

(d) ventilating means in the tipping wrapper arranged to direct ventilating air through the tipping wrapper into the channels.

4,587,983

METHOD OF INSTALLING AN ARTIFICIAL TOE OR FINGER NAIL AT THE SITE OF THE SURGICAL REMOVAL OF THE NATURAL NAIL

Lance R. Wissman, 4554 Poinsettia, S.E., Kentwood, Mich. 49508; Sandra D. Bouwer, 316 Baynton, N.E., Grand Rapids, Mich. 49503, and Cheryl L. Jeluso, 2165 Rogue River, Belmont, Mich. 49306

Filed Mar. 21, 1984, Ser. No. 591,954

Int. Cl.[4] A45D *29/00*

U.S. Cl. 132—73 **6 Claims**

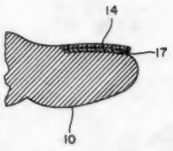
1. A method of installing an artificial nail on the nail bed of a finger or toe in the absence of the natural nail, comprising:

applying a separating agent to said nail bed;

applying a mass of initially plastic material to said nail bed;

pressing an artificial nail onto said mass during the plastic condition thereof, and bonding said nail to said mass on solidification of said mass;

removing said mass and said nail together from said nail bed;



removing the residue of said separating agent from said nail bed and said mass;

coating at least one of said nail bed and the inside face of said mass with an adhesive; and

pressing said nail and said mass in position on said nail bed.

4,587,984

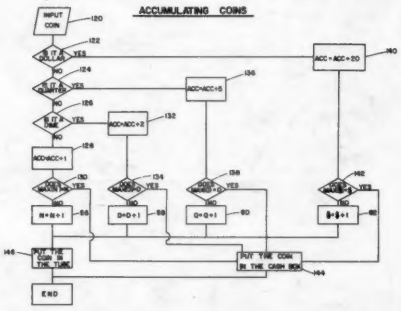
COIN TUBE MONITOR MEANS

Joseph L. Levasseur, Chesterfield, and Ronald A. Hoorman, St. Peters, both of Mo., assignors to H. R. Electronics Company, St. Louis, Mo.

Filed Jun. 1, 1983, Ser. No. 500,024

Int. Cl.[4] G07D *9/00*

U.S. Cl. 133—8 R **17 Claims**



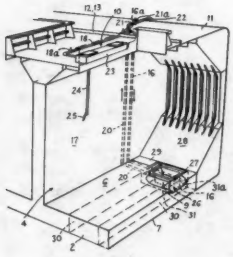
8. Means to monitor the coins available in a coin tube on a vending machine comprising means for producing a signal representative of each coin deposited, a coin tube having a coin input thereto and means to discharge coins therefrom, said coin tube being an unobstructed tubular member whereby coins entering at the input end accumulate therein in a stack without the necessity of having any means on or adjacent to the coin tube capable of detecting or sensing the level of coins therein, means to feed coins deposited in the vending machine to the coin tube for accumulation therein, means independent of the coin tube to establish a predetermined maximum number of coins that are permitted to be in the coin tube, means responsive to said last named means to divert coins deposited from entering the coin tube if the number of coins therein at least equals the predetermined maximum number of coins established, means to keep a running accumulation of coins entering the coin tube, and means to reduce the running accumulation by each coin that is discharged from the coin tube.

4,587,985

CLEANING OF VESSELS FOR HOLDING MATERIALS

Raymond Flanagan, Coulsdon, England, assignor to Si-Jet Limited, Coulsdon, England

Filed Jul. 10, 1984, Ser. No. 629,357
Int. Cl.[4] B08B *3/02, 9/08*
U.S. Cl. 134—169 R 21 Claims



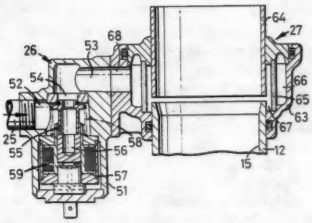
1. An installation for use in cleaning solids material from the bottom of a vessel, in which the solids material is entrained in at least one pressurized jet of fluid, said installation comprising means defining at least one aperture in the vessel bottom, means for producing a unitary flow of entraining fluid and comprising a pressurized jet of fluid for entraining liquid-borne solids material therein, and disposed in at least one location beneath said vessel bottom and beneath said aperture, said means including a housing defining an open-topped chamber of which the open top is in alignment with, and of smaller size than that of, said aperture and nozzle means disposed in, and extending transversely of, said chamber, for projecting said entrainment jet in a direction which is transversely of said housing and said aperture and generally parallel with said vessel bottom, means for producing at least one pressurized jet of liquid-containing washing fluid for washing solids material from the vessel bottom, through said aperture and into said entrainment jet, means for guiding the washing fluid entrained solids material passing through said aperture into the entrainment jet, said guide means comprising inclined wall means extending downwardly and inwardly from said aperture to said chamber open top and defining an upper wider open end which can be in communication with the vessel interior through said aperture and a lower narrower open end which is in communication with said entrainment jet through said chamber open top and at least one fluid line for the discharge of fluid entrained solids material out of the vessel, whereby in operation said entrainment jet is exposed to the vessel interior through said chamber open top, said lower and upper open ends of said guide means and said aperture, and solids material washed through the aperture by the pressurized washing fluid is guided directly into said entrainment jet to be entrained therein and the fluid entrained solids material is discharged through said discharge line in the fluid flow engendered by the entrainment jet, said inclined wall means being a hopper or funnel with said upper wider open end being provided with an outwardly projecting rim which is inset in the said aperture, which rests on, and is removably fixed to, an annular supporting lip which is rigid with the vessel bottom and which projects beneath said aperature, and with said lower narrower end being removably fixed to said housing around said chamber open top.

4,587,986

AIR/FUEL INDUCTION SYSTEM FOR SPARK IGNITION INTERNAL COMBUSTION ENGINES, AND ELECTROMAGNETIC VALVES

Thomas J. Ullman, Cranfield; Colin F. Shadbolt, Leighton Buzzard; Brian C. Pagdin; David J. Marriage, both of Dunstable; Peter J. Clarke, Leighton Buzzard, and Ian J. Sheppard, St. Albans, all of England, assignors to Solex (U.K.) Limited, Middlesex, England

Division of Ser. No. 449,786, Dec. 4, 1982. This application Feb. 15, 1985, Ser. No. 702,121
Claims priority, application United Kingdom, Jan. 15, 1982, 8201104; European Pat. Off., Nov. 30, 1982, 82306361.5
Int. Cl.[4] F16K *31/06;* F02M *51/00*
U.S. Cl. 137—1 1 Claim



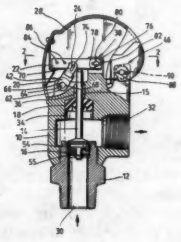
1. A method of operating an electromagnetic digital valve operable to continually open and close at a controlled frequency of opening and duration of each opening so as to control flow in accordance with the frequency of its opening and duration of each opening, the method comprising controlling the valve so that, for all operations below a predetermined "mark space ratio", it is operated with a constant opening pulse width at a respective frequency selected automatically from within the range of operating frequencies of the valve in accordance with certain external control parameters whereas for all operations at or above said predetermined mark space ratio, it is operated at a maximum frequency, the opening pulse width being selected automatically in accordance with the external control parameters.

4,587,987

SHEAR PIN RELIEF VALVE

David G. West, McLoud, Okla., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Aug. 23, 1984, Ser. No. 643,531
Int. Cl.[4] F16K *13/04*
U.S. Cl. 137—70 4 Claims



1. A pressure relief valve comprising:

(a) a hollow body having an inlet passageway at its bottom, a side outlet passageway, and a top passageway axially aligned with said inlet passage way;

(b) a valve fitted within said inlet passageway in sliding fluid tight relation;

(c) a valve stem connected at its lower end to said valve and extending through said top passageway in sliding relation to terminate exterior of said body;

(d) a transversely disposed bar member arranged to rest on top of said valve stem at an intermediate point along said bar member when said valve is seated in said inlet passageway;

(e) one end of said bar member pivotally mounted on said hollow body to enable said bar member to pivot in a plane along the axis of said stem, the opposite end of said bar defining a plurality of holes spaced along said bar member in an arc of a circle;

(f) a link interconnecting said opposite end of said bar member to said body when said valve is seated in said inlet passageway, said link defining a hole in a first end thereof positioned to register with one of said holes in said bar member so as to receive a shear pin to connect said bar member with said link, the end of the link opposite said first end of said link pivotally mounted in said body along a link pivot axis parallel to the pivot axis of said bar member, said link pivot axis being the center of said arc;

(g) a hollow cover member configured to enclose the top of said body member, including said bar member, and pivotally mounted to the top of said body member on a side of said body member substantially laterally opposite from said opposite end of said bar in relation to said valve stem;

(h) a spring member interposed between said cover member and said body member and biased to urge said cover member to move about its pivot mounting so as to uncover the top of said body member; and

(i) a latch interconnecting said cover member and said opposite end of said bar member pending the shearing of said shear pin connecting said bar member and said link.

4,587,988

HYDRAULIC PRESSURE-RELIEF VALVE

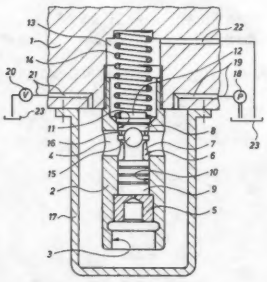
Heinz Schulte, Marktheidenfeld, Fed. Rep. of Germany, assignor to Mannesmann Rexroth GmbH, Lohr/Main, Fed. Rep. of Germany

Filed Sep. 12, 1984, Ser. No. 649,511

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1983, 3333164

Int. Cl.[4] F16K *17/02*

U.S. Cl. 137—110 **7 Claims**



1. A pressure-relief valve comprising:

a housing forming

a chamber extending along an axis, and

a valve seat centered on the axis and subdividing the chamber into an outer high-pressure compartment and an inner low-pressure compartment, the seat defining generally the only fluid-communication path between the compartments;

means including conduits for supplying fluid under high pressure to the high-pressure compartment and for withdrawing fluid from the low-pressure compartment, whereby a pump and a load can be connected to the high-pressure compartment and a sump to the low-pressure compartment;

a valve body centered on the axis and formed with

a central radially outwardly open main groove,

an outer face exposed in the high-pressure compartment,

an inner face exposed in the low-pressure compartment,

a radially outwardly open control groove offset axially inward from the main groove toward the inner face, and

a diametrally throughgoing control bore at the main and control grooves,

the body being axially displaceable through the seat between a closed position substantially blocking the seat with the main groove and control bore axially offset therefrom and an open position axially offset toward the low-pressure compartment from the closed position and with the main groove and control bore at the seat for flow through the main groove and seat between the compartments, and through an intermediate position between the open and closed positions and with the control bore at the seat for flow through the control bore and control groove between the compartments; and

spring means for urging the valve body axially outward toward the high-pressure compartment into the closed position.

4,587,989

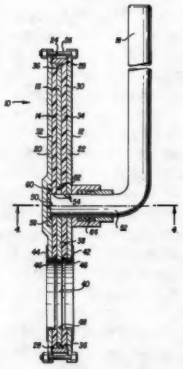
TURN DISC SLIDE VALVE

John D. Mayhew, Jr., 7511 Campbell Dr., Salem, Va. 24153

Filed Feb. 20, 1985, Ser. No. 703,371

Int. Cl.[4] F16L *7/00*

U.S. Cl. 137—375 **12 Claims**



1. A turn disc valve comprising:

a generally rigid, sealed, valve body having first and second generally coextensive side-wall rigid plates sealed with a spacing wall extending between said two rigid plates for spacing said rigid plates a fixed distance one from the other, so that said spacing wall and said plates define a flat body cavity therebetween, said two rigid plates having aligned body flow holes extending laterally therethrough for forming a fluid passage through said valve body;

a relatively-resilient valve liner means of a size and shape for snugly fitting in said flat cavity, said relatively-resilient valve liner means comprising first and second substantially flat side liner elements each of a size and shape for substantially covering opposite interior side walls of said flat cavity in said body and a spacer insert element positioned between said two side liner elements having a substantially circular radial interior surface for defining, with said flat side liner elements, a flat circular valve cavity and both said side liner elements defining liner flow holes spaced radially inwardly from said radial interior surface of said spacer insert element, said holes extending

laterally therethrough communicating with said flat circular valve cavity for forming a fluid passage coinciding with the fluid passge of said body when said liner means is mounted in said body cavity;

a circular, flat, gate positioned snugly in said valve cavity whose outer diameter is substantially surrounded by the radial interior surface of said spacer insert element but having freedom of rotation therein, said circular gate having a hole therethrough spaced radially inwardly from said outer diameter which, when said gate is rotated about an axis, can be brought into and out of registration with said body flow holes and said lining flow holes to respectively allow fluid to pass through said fluid passage and to block said fluid from passing therethrough; and

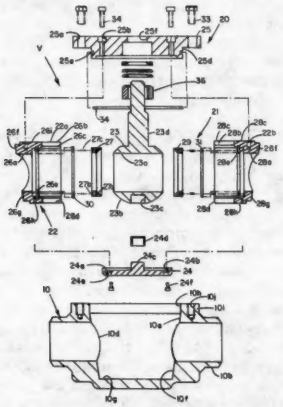
a drive means extending through said body and said liner for engaging said circular flat gate therein and rotating it from outside said body.

4,587,990

MODULAR BALL VALVE

Raymond Pennell, Tomball, and Bobby J. Reneau, Houston, both of Tex., assignors to Gripper, Inc., Houston, Tex.

Filed Oct. 23, 1984, Ser. No. 664,068
Int. Cl.[4] F16K *25/00*
U.S. Cl. 137—454.2 **5 Claims**



1. A modular valve comprising:

an outer housing generally cylindrical in configuration, said outer housing having a flowline bore extending therethrough along a longitudinal axis;

said outer housing including housing mount means for mounting said outer housing in a pipeline having a pipeline bore whereby said flowline bore of said outer housing is aligned with said bore of said pipeline;

said outer housing having a transverse frusto-conical bore extending into said outer housing, said transverse frusto-conical bore extending across said flowline bore;

modular valve means mounted within said transverse bore, said modular valve means including a valve assembly and valve mount means for mounting said valve assembly for movement within said modular valve means between open and closed positions to control flow through said flowline bore of said outer housing;

modular mount means for interconnecting said modular valve means, valve assembly and valve mount means mounted means into a module for removal as a module from said outer housing transverse bore;

said modular valve means including

an internal housing which is generally cylindrical in a plane transverse to said longitudinal axis of said housing, said internal housing having a first bore aligned with said flowline bore of said outer housing and a second bore transverse to said first bore and extending across said first bore;

a valve element mounted within said first and second bores of said generally cylindrical internal housing, said valve element having a valve bore therethrough;

said valve mount means mounting said valve element for movement between open and closed positions, said valve bore being aligned with said first bore of said internal housing with said valve element in said open position, said valve mount means mounting said valve element in a sealed relationship with said first bore and second bore of said internal housing with said valve element in a closed position;

said transverse frusto-conical bore of said outer housing further including a first bore portion having a first annular frusto-conical mounting surface and a second bore portion including a second annular frusto-conical mounting surface, said first bore portion of said transverse bore of said outer housing having a greater diameter than said second bore portion;

said generally cylindrical internal housing being generally cylindrical in a direction parallel to said longitudinal axis of said outer housing and being generally frusto-conical in configuration along an axis transverse to said longitudinal axis of said outer housing; and

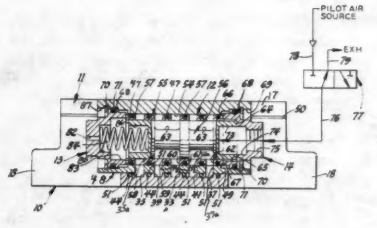
said internal housing having first and second annular mounting rims, said first annular rim of said internal housing having a diameter greater than said second annular rim, said first annular mounting rim sealing engaging in a metal-to-metal seal said first bore portion of said transverse frusto-conical bore of said outer housing and said second annular mounting rim sealingly engaging in a metal-to-metal seal said second bore portion of said transverse bore of said outer housing.

4,587,991

VALVE WITH UNIPLANAR FLOW

William J. Chorkey, 34300 Lyncroft, Farmington, Mich. 48024

Filed Feb. 8, 1983, Ser. No. 464,872
Int. Cl.[4] F15B *13/042*
U.S. Cl. 137—454.6 **5 Claims**



1. A reversing fluid flow control valve having a valve base which has a top side and a lower side, and a valve spool body characterized in that:

(a) said valve base is provided with an elongated, longitudinal shaped cavity which is open along the top side thereof;

(b) said valve base includes an inlet port, having a longitudinal axis, connected to a vertical, rectangular, inlet passage communicating with said cavity;

(c) said valve base includes at least one cylinder port, having a longitudinal axis, connected to a vertical, rectangular cylinder passage communicating with said cavity;

(d) said valve base includes at least one exhaust port, having a longitudinal axis, connected to a vertical, rectangular exhaust passage communicating with said cavity;

(e) said valve spool body is removably seated in said cavity

in the valve base and has vertical, rectangular, inlet, cylinder and exhaust passage which are verticaly aligned with the inlet, cylinder and exhaust passages in the valve base, and the valve spool body has movably mounted therein a reversing valve spool having a longitudinal axis, for controlling the flow of fluid between said inlet passages and said cylinder passages, and between said cylinder passages and said exhaust passages;

(f) means for releasably securing the valve spool body to the valve base; and,

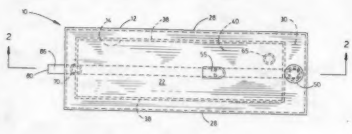
(g) the lower side of said valve spool body having a shape complementary with the shape of the cavity in the valve base, and said ports are disposed in uniplanar positions relative to each other, whereby when fluid passes into said inlet port, it will pass through the valve base and valve spool, and valve spool body in a uniplanar manner, and out through said cylinder port.

4,587,992

HYDRAULIC RESERVOIR WITH CONTAMINATION SEPARATION

Donald E. Thompson, P.O. Box 1036, Hughson, Calif. 95326

Filed May 17, 1984, Ser. No. 611,328
Int. Cl.[4] E03B *11/00*
U.S. Cl. 137—576 **6 Claims**



1. A fluid reservoir comprising:

a first container having predetermined bottom portion; a predetermined upper portion spaced from the bottom portion; and side portions interconnecting the bottom and upper portions to define a substantially closed internal chamber of predetermined volume adapted to contain fluids;

a second container disposed within said internal chamber and having a predetermined bottom portion; a predetermined upper portion spaced therefrom; and side portions interconnecting the bottom and upper portions to define a substantially closed internal cavity of predetermined volume adapted to contain fluids, the side portions providing at least one conduit to permit the flow of fluids between the inner chamber of the first container and the internal cavity of the second container;

an inlet member mounted by the first container having an internal portion extended into the internal chamber and an external portion adapted to be connected in fluid-flow relation to a source of fluids for the delivery of such fluids to the internal chamber; and

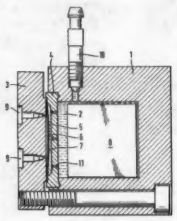
an elongated outlet member providing a bore longitudinally therethrough and having an internal portion disposed within the internal cavity of the second container and an external portion disposed externally of the first container and adapted for connection in fluid-flow relation to means for creating a fluid demand to draw fluid from the internal cavity through the bore of the outlet member.

4,587,993

HIGH-PRESSURE VISCOUS DAMPER

Hans-Georg Härtl, Waldbronn, Fed. Rep. of Germany, assignor to Hewlett-Packard GmbH, Boeblingen, Fed. Rep. of Germany

Continuation of Ser. No. 580,572, Feb. 15, 1984, abandoned. This application Jun. 6, 1985, Ser. No. 742,632
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1983, 3306631
Int. Cl.[4] F16L *55/04*
U.S. Cl. 138—30 **10 Claims**



1. A high pressure viscous damper for damping pressure and flow variations in a fluid, particularly for use in a liquid chromatograph, comprising:

a first chamber adapted to receive a fluid to be damped;

a closed second chamber holding a damping liquid;

an elastic partition separating the first chamber from the second chamber; and

an insert filling a substantial portion of the volume of the second chamber and the remaining portion of the volume of the second chamber being substantially filled with the damping liquid so that substantially no gas is present within the second chamber, said insert having a predetermined volume and temperature expansion coefficient relative to the volume of the second chamber, the temperature expansion coefficient of the material of the walls of the second chamber, the volume of the damping liquid and the temperature expansion coefficient of the damping liquid to compensate the linear portions of the temperature-dependent volume variations of the second chamber and the damping liquid so that in the operating temperature range of the damper the position of the elastic partition remains substantially constant but can move in response to pressure changes independent of temperature.

4,587,994

SEWER DRAIN SECURING DEVICE FOR USE WITH RECREATIONAL VEHICLES

Gordon R. Links, 1616 La Playa, N.E., Albuquerque, N. Mex. 87111, and Alvin L. Ellisor, 5739 Ouray Rd., N.W., Albuquerque, N. Mex. 87120

Filed Sep. 12, 1985, Ser. No. 775,225
Int. Cl.[4] F16L *55/10*
U.S. Cl. 138—89 **13 Claims**

1. Securing device, for securing to the inlet of a pipe a flexible hose having a corrugated outer wall with minimum and maximum radii R_{MIN} and R_{MAX} respectively, comprising:

(a) a base comprising a section of essentially cylindrical tubing of a size which may be securely attached to said inlet of said pipe in a fluid-tight connection, said base further comprising:

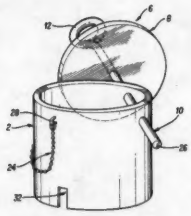
(1) a stop means, attached to the inside wall of said base, for stopping any circular object having a diameter forming an essentially smooth fit with the inside diameter of said base from sliding freely through the entire length of said base;

(2) two holes through the wall of said base, located essentially upon an axis which is a chord of a circular cross section of the inside wall of said base, where the shortest distance R_{CA} from said chord to the cylindrical axis of said base satisfied the relationship

$R_{MIN} < R_{CA} < R_{MAX}$

(b) a stopper-pin assembly, comprising:

(1) an essentially circular stopper, having a diameter forming an essentially smooth fit with the inside wall of said base;



(2) a pin, connected to said stopper, having a diameter forming an essentially smooth fit with said holes in said base, having a length on at least one side of said stopper exceeding the distance between said holes in said base;

(c) connection means, connected to said base and to said stopper-pin assembly, for flexibly but securely connecting said stopper-pin assembly to said base.

4,587,995

VIBRATION-INSULATING AND VIBRATION-DAMPING SUSPENSION FOR A WEAVING MACHINE

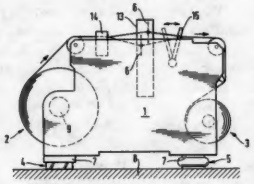
Ulrich Bolleter, Seuzach, and Werner Schaad, Schaffhausen, both of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Oct. 9, 1984, Ser. No. 658,780

Claims priority, application European Pat. Off., Oct. 19, 1983, 831104039

Int. Cl.⁴ D03J *1/00*

U.S. Cl. 139—1 R **12 Claims**



1. In combination

a weaving machine having at least one foot on a warp side and at least one foot on a cloth side; and

a vibration-insulating and vibration-damping suspension for said weaving machine, said suspension including a first bearing element supporting said warp side foot thereon and a second bearing element supporting said cloth side foot thereon, said bearing elements having spring constants which differ from each other at least in a vertical direction by at least one order of magnitude.

4,587,996

WEFT YARN CONTROL FOR A WEAVING MACHINE ROTOR

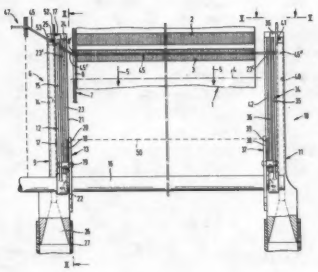
Alois Steiner, Rieden, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Dec. 28, 1984, Ser. No. 687,178

Claims priority, application European Pat. Off., Jan. 7, 1984, 84100092.0

Int. Cl.⁴ D03D *49/70*

U.S. Cl. 139—194 **10 Claims**



1. In combination,

a weaving rotor for a weaving machine;

a weft yarn control for controlling a weft yarn picked into a shed moving with said rotor, said control including a pair of weft clamping and severing devices, each said device being disposed on a respective side of said rotor and including;

a suction tube having a longitudinally extending groove disposed transversely of the picking direction and a longitudinally extending gap disposed transversely of said groove to draw air into said tube;

a weft clamping lever for movement into said groove to clamp a weft yarn therein;

a first blade connected to said lever;

a second blade disposed on said tube adjacent said first blade for severing a weft yarn therebetween; and

a spring secured to said tube between said groove and said rotor and extending over the length of said groove in resilient engagement with said tube.

4,587,997

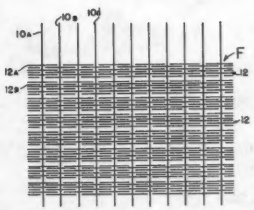
WOVEN SHADE SCREEN

James S. Brooks, Tuscaloosa, Ala., assignor to Phifer Wire Products, Inc., Tuscaloosa, Ala.

Filed Feb. 20, 1985, Ser. No. 703,309

Int. Cl.⁴ D03D *15/00*

U.S. Cl. 139—420 R **12 Claims**



1. A woven shade screening fabric comprising a plurality of individual, spaced strands in parallel relationship in one direction of either the warp or fill of a woven fabric and comprising individual strands in substantially uniform pattern, a plurality

of groups of strands closely associated in side-by-side relationship in the other direction of the fabric of the warp and fill from that of the preceding described uniform strands, said groups of strands being equally spaced to provide an open weave mesh pattern therebetween for the purposes of admitting some light and air while blocking some of the glare and sunlight, and the strands in each of said groups being arranged with one strand over and the next strand under in alternating interlocking relationship at the point of crossing each of the respective strands in the other direction whereby in each point of intersection some of said strands are over and some of said strands are under and the next successive crossing of groups of strands alternate from the preceding one, each of the next successive strands alternating from over to under at each intersection and then alternating from under to over at the next intersection, the improvement comprising:

the strands in the warp direction being vinyl coated fiberglass yarns comprising a fiberglass core yarn which is coated with a vinyl material,

the yarns in the other direction being a vinyl coated polyester yarn comprising polyester core yarn which has been coated with a vinyl composition.

4,587,998

FILLING-THREAD INSERTION GRIPPER FOR A RAPIER WEAVING MACHINE

Anton Egloff, Jona, and Lothar Köhler, Tann-Rüti, both of Switzerland, assignors to Maschinenfabrik Sulzer-Rüti AG, Rüti, Switzerland

Filed Nov. 19, 1984, Ser. No. 673,085

Claims priority, application European Pat. Off., Dec. 14, 1983, 83810590.6

Int. Cl.⁴ D03D *47/18*

U.S. Cl. 139—448 **7 Claims**

1. A filling-thread insertion gripper for a rapier weaving machine, comprising:

a stationary clamping jaw;

a substantially rigid transport clamping tongue having a free end and lying in its direction of longitudinal extent against said stationary clamping jaw to form conjointly therewith a clamping slot for clamping in said clamping slot at least one filling thread;

said substantially rigid transport clamping tongue containing an extension tip and;

said extension tip being elastically deformable transversely to said direction of longitudinal extent at said free end of said substantially rigid transport clamping tongue.

4,587,999

PROCESS FOR THE PRODUCTION OF A BALL POINT PEN CARTRIDGE

Rudolf Boiko, and Günter Ulrich, both of Hanover, Fed. Rep. of Germany, assignors to Pelikan AG, Hanover, Fed. Rep. of Germany

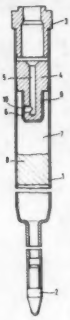
Filed Dec. 22, 1980, Ser. No. 219,284

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1979, 2951611

Int. Cl.⁴ B65B *31/02*; B43K *7/10*

U.S. Cl. 141—1 **1 Claim**

1. Process for production of a great quantity of ball point pen cartridges, the ink columns of which are constantly acted upon by high-pressure gas, characterized by providing at the rear end of each ink tube at a distance from the end of the ink column, a valve which opens into the interior of the ink tube, placing the cartridges into a container, introducing high-pressure gas into the container at a pressure to correspond to the pressure wanted in each cartridge, then reducing the gas pressure in the chamber and removing the cartridges from the chamber.



4,588,000

METHOD AND APPARATUS FOR METERING AND DISPENSING VOLATILE LIQUIDS

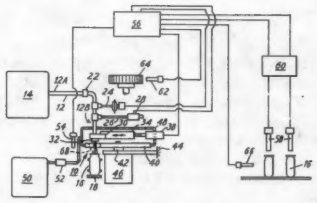
John D. Malin, Reading, and Paul Porucznik, Kennington, both of United Kingdom, assignors to Metal Box public limited company, Berkshire, United Kingdom

Filed Aug. 19, 1983, Ser. No. 526,491

Claims priority, application United Kingdom, Aug. 26, 1982, 8224489

Int. Cl.⁴ B65B *3/04*

U.S. Cl. 141—1 **22 Claims**



20. A method of dispensing small metered quantities of a low temperature volatile liquid into a surrounding atmosphere which is substantially at room temperature and pressure (hereafter referred to as said atmosphere), which temperature is substantially above the boiling point of said liquid when in said atmosphere, which method comprises:

(a) mounting a displaceable valve member adjacent a free end of a stationary nozzle for transverse sliding movement across and in close cooperation with said nozzle free end to cover and uncover, alternately, an aperture formed in that free end, said aperture being in communication with a supply source of said liquid;

(b) driving said valve member so as to cover and uncover said free end of said nozzle successively, and;

which method is characterized by the steps of:

(i) supplying said liquid to said aperture from a remotely disposed pressurized supply source through a delivery pipe which is thermally insulated so as to prevent said liquid from boiling while flowing therethrough;

(ii) exposing all parts of said valve member to said atmosphere except the part thereof which, for the time being, lies directly adjacent said nozzle end; and

(iii) causing said liquid emerging from said aperture to

flow from said nozzle end as a coherent jet and directly into said atmosphere.

4,588,001

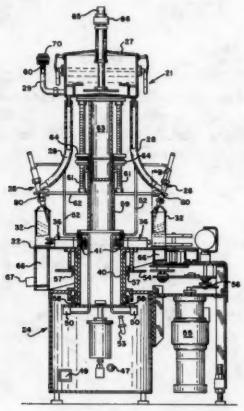
ROTARY FILLING APPARATUS AND METHOD

George E. Leonard, Bettendorf, Iowa, assignor to The Kartridg Pak Co., Davenport, Iowa

Continuation-in-part of Ser. No. 507,087, Jun. 23, 1983, Pat. No. 4,532,968. This application May 1, 1985, Ser. No. 729,976

Int. Cl.[4] B65B *3/04*

U.S. Cl. 141—5 27 Claims



23. A method of the type which uses gravity for filling a liquid into a plurality of containers while they rotate about a rotary filling head, comprising:

positioning a container to be filled onto a turntable having a generally vertical central axis;

rotating the turntable about its axis to bring the container into alignment with a dispensing nozzle;

flowing a predetermined amount of liquid from a reservoir and through the dispensing nozzle outlet orifice spaced a predetermined distance from the central axis while the dispensing nozzle outlet orifice and the reservoir are rotating about the generally vertical central axis, said flowing step including directing liquid from said nozzle outlet orifice in a non-vertical direction and toward a sidewall of each container;

sensing the level of liquid within the rotating reservoir and adjusting the level of liquid within the rotating reservoir in response to the sensing step; and

said flowing step is responsive to the sensing and adjusting steps in order to control the amount of liquid that is dispensed through said nozzle outlet orifice.

4,588,002

HOT MELT ADHESIVE APPLICATOR SYSTEM

Richard M. Braddock, and Kenneth G. Alexander, both of Melbourne, Australia, assignors to Alexander Packaging Equipment Pty Ltd., Briar Hill, Victoria, Australia

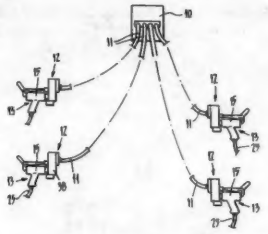
Filed Oct. 1, 1984, Ser. No. 656,624

Claims priority, application Australia, Oct. 3, 1983, PG1671

Int. Cl.[4] B65B *3/04*

U.S. Cl. 141—18 11 Claims

11. A hot melt adhesive applicator gun of the hand held type having a chamber for storing a supply of molten adhesive, an applicator nozzle communicating with said chamber, a control trigger for actuating a piston in said chamber to force molten adhesive from said chamber through said nozzle and a charge valve for enabling said chamber to be filled and refilled with molten adhesive by interconnection with a refill adaptor, characterized in that, said gun includes a plunger extending through a wall of said chamber and being adapted to be forced outwardly to a fully extended position when said chamber is full, said plunger being adapted for co-operation with clamp means on a refill adaptor, which clamp means retain said gun in



connection with said refill adaptor, whereby outward movement of said plunger is adapted to disengage said clamp means from said gun such that disengagement is complete when said plunger is fully extended, said clamp means being adapted to deactivate a filling or refilling operation when disengagement is complete.

4,588,003

REFUSE PACKAGING ASSEMBLY

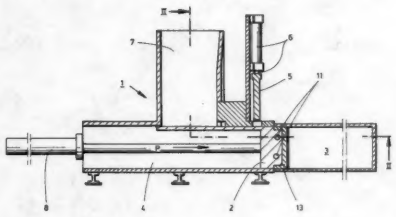
Erwin Kaldenbach, Ratingen, Fed. Rep. of Germany, assignor to Lindemann Maschinenfabrik GmbH, Düsseldorf, Fed. Rep. of Germany

Filed Apr. 6, 1984, Ser. No. 597,429

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1983, 3312445

Int. Cl.[4] B65B *1/24*

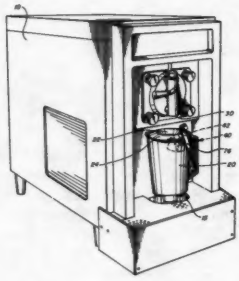
U.S. Cl. 141—71 9 Claims



1. In a refuse packaging assembly comprising a refuse press and a container adapted to be attached to said refuse press for filling thereby, wherein said refuse press includes a press box having an outlet at one end thereof, and a pressing plunger disposed in said press box for axial movement therethrough, said container including means defining a filling opening, and a closure plug adapted to close said filling opening and wherein said assembly includes a releasable connecting means for coupling said closure plug to said pressure plunger, the improvement which comprises that said releasable connecting means includes a common power drive, at least one pair of cooperating pins actuated by said common power drive, one pin of each pair being associated with the pressing plunger while the other pin is associated with the container and both pins of each pair in coupling position are capable of engaging a coupling bore of the closure plug in coaxially, opposite directions, and said connecting means includes means actuated by said common power drive for releasably connecting said container to said press box so that said container can be connected to said press box when said pressing plunger is connected to said closure

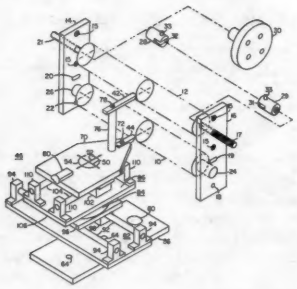
plug and when said container is released from said press box said closure plug is connected to said container.

4,588,004
BLENDER CUP WITH PIVOTABLE MEASURING DEVICE MOUNTED THEREIN
John M. Herbert, 351 Normandy Dr., Norwood, Mass. 02062
Filed Dec. 24, 1984, Ser. No. 685,315
Int. Cl.[4] B65B *3/04*
U.S. Cl. 141—377 **8 Claims**



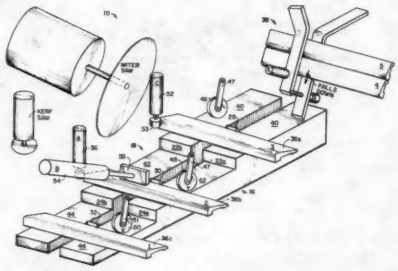
1. In a blender cup, the improvement comprising a measuring device pivotably mounted within said cup for movement between a first position, in which a desired ingredient may be introduced into the measuring device, and a second position, in which the ingredient is emptied into the blender cup.

4,588,005
DUPLICATOR ATTACHMENT FOR WOODTURNING LATHES
James A. Sliker, 20 Manorshire Dr., Apt 8, Fairport, N.Y. 14450
Filed Jan. 9, 1984, Ser. No. 569,133
Int. Cl.[4] B23B *3/28*
U.S. Cl. 142—7 **18 Claims**



9. A duplicator attachment for use with a turning lathe having a bed and a drive head which rotates a workpiece about the center line of said lathe to enable cutting of a duplicate of a pattern, said duplicator attachment comprising a support arm mounted in a horizontal plane to said lathe, a support member also disposed in a horizontal plane and spaced from said arm for carrying a tool for cutting said workpiece and a tracer for tracing said pattern in aligned relationship thereof, a carriage on said arm having first, second and third sections, said first and second sections having said arm and said support member respectively connected thereto, one of said first and second sections having means responsive to the movement of said support member for enabling movement of said support member in a longitudinal direction along the lathe center line, the other of said first and second sections having means also responsive to the movement of said support member for enabling movement of said support member in a lateral direction perpendicular to the lathe ceter line, said third section being disposed between said first and second sections and being movable therewith and rotatably mounting said second section on said first section for rotation about a vertical axis mutually perpendicular to said longitudinal and lateral directions, and means on said support member for manipulation by an operator to enable simultaneous controlled conjoint movement of said cutting tool and tracer laterally, longitudinally and rotationally.

4,588,006
HIGH SPEED HOPPER FED TRIM SAW
Erling S. Jangaard, Madeira Beach, Fla., assignor to Ruvo Automation Corp., Largo, Fla.
Filed Mar. 8, 1985, Ser. No. 709,906
Int. Cl.[4] B27F *5/12*
U.S. Cl. 144—3 R **16 Claims**



1. A machine that makes a substantially reproducible miter cut and kerf cut in individual trim boards as a plurality of said boards are presented in rapid succession to the miter cutting and kerf cutting members of the machine, comprising,

a pair of stationary, elongate base members disposed in parallel, transversely spaced apart relation to one another in a common horizontal plane,

each of said base members having a pair of longitudinally spaced, first and second steps formed therein,

said steps formed in said base members cooperatively defining a first bifurcated support surface, a second bifurcated support surface stepped downwardly therefrom, and a third bifurcated support surface spaced downwardly from said second bifurcated support surface,

a hopper means for depositing an elongate board to be trimmed onto said first bifurcated support surface such that the longitudinal axis of symmetry of the board is orthogonally disposed with respect to the respective longitudinal axes of symmetry of said base members,

an elongate carriage member disposed downwardly and intermediate of said spaced base members, in non-contacting relation thereto,

means for linearly reciprocating said carriage member relative to its longitudinal axis of symmetry,

a plurality of longitudinally spaced index members carried by said carriage member, said plurality including a first, second and third index member,

each of said index members extending upwardly at an angle from said carriage member so that their respective distal free ends are disposed upwardly of the respective horizontal planes defined by the first, second and third bifurcated support surfaces,

said first index member, when displaced in a forward direction, abuttingly engaging a first trim board and advancing

it forwardly until said board falls under the influence of gravity from said first bifurcated support surface to said second bifurcated support surface,

said second index member, when displaced in a forward direction simultaneously with the displacement of said first index member, abuttingly engaging a second trim board and advancing it forwardly until said second board falls under the influence of gravity from said second bifurcated support surface to said third bifurcated support surface,

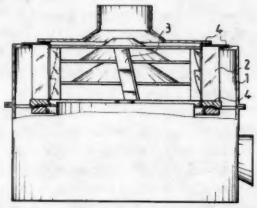
and said third index member, when displaced in a forward direction simultaneously with the displacement of said first and second index members, abuttingly engaging a third trim board and advancing it forwardly relative to said third bifurcated support surface until said carriage member reaches the forwardmost limit of its linear travel.

4,588,007

METHOD FOR RETARDING THE DULLING OF WOOD-MACHINING BLADES

Pentti Raura, and Johan J. Hotma, both of Valko, Finland, assignors to Rauma-Repola Oy, Valko, Finland

Filed Oct. 4, 1983, Ser. No. 538,915
Claims priority, application Finland, Feb. 25, 1983, 830629
Int. Cl.[4] B27C *1/00*
U.S. Cl. 144—176 **5 Claims**



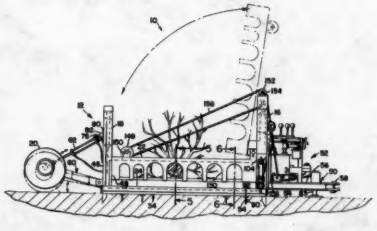
1. In a method for retarding the dulling of wood-machining blades in a wood chipper having a blade ring connected to a frame and a rotatable rotor cooperating with said blade ring, the improvement comprising insulating said blade ring from said rotor and applying a differential voltage between said blade ring and said rotor during the chipping of wood by said blade ring and said rotor.

4,588,008

APPARATUS AND METHOD FOR DELIMBING TREE TRUNKS

Wallace Napper, Rte. 7, Box 115, International Falls, Minn. 56649

Filed Jul. 22, 1985, Ser. No. 757,344
Int. Cl.[4] B27L *1/06*
U.S. Cl. 144—343 **16 Claims**



1. Apparatus for delimbing tree trunks, said trunks being pulled through said apparatus with a vehicle, said apparatus comprising:

a platform;

first and second posts rising from opposite ends of said platform;

upper and lower bars extending between said first and second posts, said upper and lower bars including first and second means for cutting limbs from said trunks;

means for retracting said lower bar into said platform so that said vehicle can drive over said platform; and

means for separating said upper bar from said lower bar so that said vehicle can drive over said platform;

whereby said vehicle can be driven over said platform to position said trunks between said upper and lower bars for delimbing.

15. A method of delimbing tree trunks by pulling said trunks with a vehicle through an apparatus having a frame with a platform and first and second posts rising vertically from opposite ends of the platform, said apparatus further including upper and lower bars extending between said posts, at least one of said bars including means for guiding the tree trunks between said upper and lower bars, said upper and lower bars each including means for cutting limbs from said trunks, said apparatus also having means for moving each of bars, said method comprising the steps of:

retracting said lower bar into a slot in said platform;

pivoting said upper bar upwardly with respect to said lower bar;

driving said vehicle over said platform and said lower bar and generally between said upper and lower bars;

raising said lower bar from said slot to contact said trunks;

pivoting said upper bar downwardly to contact said trunks;

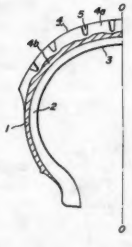
pulling said trunks with said vehicle between said upper and lower cutter bars to delimb said trunks.

4,588,009

PNEUMATIC TIRE FOR MOTORCYCLE HAVING AN EXCELLENT ABSORBABILITY TO EXTERNAL DISTURBANCES

Yoichi Kitazawa, Higashiyamato, and Toshiharu Kikutsugi, Kodaira, both of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Sep. 4, 1984, Ser. No. 646,544
Claims priority, application Japan, Sep. 9, 1983, 58-164940
Int. Cl.[4] B60C *11/04, 11/00*
U.S. Cl. 152—209 R **6 Claims**



1. A pneumatic tire for motorcycles having an excellent absorbability to external disturbances and comprising a tread, a pair of sidewalls extending from both side ends of the tread and a toroidal carcass reinforcing the tread and sidewalls;

said tread having a laminate structure inclusive of a base rubber having a storage modulus (E') of 50–90 kg/cm^2 and a ratio of loss tangent to storage modulus (tan δ/E') of $2.5\times10^{-3}\sim5.0\times10^{-3}$ and a cap rubber having a storage modulus higher than that of said base rubber; and

said base and cap rubbers being arranged as one body along the carcass between the sidewalls up to positions corresponding to the maximum width of the tire.

4,588,010

ANTI-SKID DEVICE FOR MOTOR VEHICLE TIRES

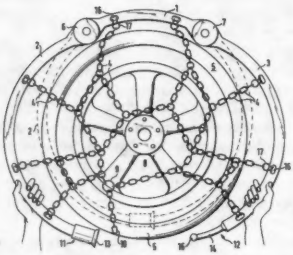
Carlo Melzi, and Paolo Gregorutti, both of Tarvisio, Italy, assignors to Acciaierie Weissenfels S.p.A., Tarvisio, Italy

Filed Feb. 7, 1984, Ser. No. 577,860

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1983, 3305073; May 20, 1983, 3318551; Dec. 28, 1983, 8337510[U]

Int. Cl.[4] B60C *27/10, 27/06*

U.S. Cl. 152—213 A 42 Claims



1. An anti-skid device for a motor vehicle tire comprising front and rear holding devices disposed, when mounted on a tire, against the outside and inside of the tire, respectively, at least the rear of said holding devices being comprised, prior to assembly of the anti-skid device, of at most three pre-assembled sections including a middle and two side sections, each side section being pivotally linked by pin means to said middle section in overlapping extensions of said middle and side sections to permit radial outward movement of the side sections relative to said middle section thereby to open the rear holding device to enable passing thereof in its pre-assembled form over the tire, said middle and two side sections being rigid and essentially of circular form when said at least rear holding device is mounted on the tire, said front and rear holding devices having attached thereto cross chains extending over the running surface of the tire, and pretensioned spring means fixedly directly attached to said pin means, forming part of the pre-assembled rear holding device, at each pivotal link to said rigid middle section for rotationally urging said rigid side sections radially inwardly relative to said rigid middle section into closed circular form after passing said at least rear holding device over the tire and holding said two rigid side sections and said rigid middle section under pretension in its closed fixed circular form.

33. In an anti-skid chain for motor vehicle tires, a locking means for an expandable chain mounting device constructed in the form of an inherently stiff ring that can be expanded by opening outwardly for mounting, the locking means comprising two supporting bodies, each of which is attached to one end of the chain mounting device, an engagement means provided on one supporting body and acting as a point of engagement for a locking element provided on the other supporting body, and wherein each supporting body is provided with an engagement means as well as with a locking element, the engagement means and the locking elements being arranged on the two supporting bodies as mirror images of each other, the locking elements being provided on mutually facing ends of the supporting bodies and extending away from the side surface of the tire as hooks bent against the opening direction of the chain mounting device, and wherein the mutually facing end regions of the two supporting bodies laterally overlap each other in the engaged position.

4,588,011

TIRE-DEMOUNTING DEVICE

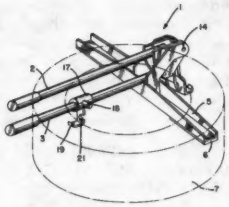
Eickhart Goebel, Elbestrasse 11, D-6102 Pfungstadt, Fed. Rep. of Germany

Filed Feb. 1, 1985, Ser. No. 697,229

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1984, 3403971

Int. Cl.[4] B60C *25/06*

U.S. Cl. 157—1.17 10 Claims



1. A tire-demounting apparatus for demounting a tire from a rim in a tire/rim assembly where the beads of the tire extend over the rim and are located behind the rim flanges, which are bent radially inwards, said apparatus comprising:

first and second elongated arms each joined at one end by a pincer pivot to form a pair of pincers;

a first bead-breaking element pivotally mounted near said pincer pivot;

a second bead-breaking element pivotally mounted near said pincer pivot; and

first and second pivots for pivotally mounting said first and second bead-breaking elements, respectively, said first and second pivots being at different distances from said pincer pivot so that, when said first arm is pivoted relative to said second arm, said first bead-breaking element exerts a force component on one of the beads of said tire, said force being substantially radial relative to said tire, and said second bead-breaking element exerting a force component which is substantially axial relative to said tire.

4,588,012

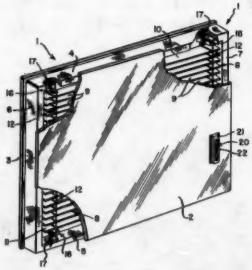
MAGNETIC ACTUATING MECHANISM FOR PIVOTAL VENETIAN BLIND ASSEMBLY

Richard N. Anderson, Owensboro, Ky., assignor to Hunter Douglas Inc., Totowa, N.J.

Continuation-in-part of Ser. No. 404,468, Aug. 2, 1982, Pat. No. 4,480,674. This application Nov. 9, 1982, Ser. No. 440,295

Int. Cl.[4] E06B *9/38*

U.S. Cl. 160—174 10 Claims



1. A magnetic actuating mechanism for a pivotal venetian blind assembly having a plurality of adjacent slats including an end slat at each end thereof, at least one slat supporting cable

forming a part of a supporting means supporting said slats, a hanger pivot member adapted to be pivotally mounted with respect to a frame member positioned adjacent each end slat of said plurality of slats supporting a slat supporting cable therebetween, a linearly movable operating element, connecting means operably connecting said operating element with each hanger pivot member, a linearly movable operable element and magnet means operatively connecting said operable element with said operating element, characterized in that said operating element comprises a split housing formed by a notch therein on a side thereof facing said slats to form to similar housing sections, in that each housing section has at least on magnet therein, in that said housing is connected between said sections, in that said housing has an upwardly extending vertical arm and a downwardly extending vertical arm each connected at one of its ends to said housing between said sections and each connected at the other of its ends to said connecting member.

4,588,013

BINDERS FOR FOUNDRY CORES AND MOULDS

John G. Morley, Kings Coughton, near Alcester, England, assignor to BCIRA, Birmingham, England

Filed Mar. 29, 1985, Ser. No. 717,682

Claims priority, application United Kingdom, Apr. 12, 1984, 8409494

Int. Cl.[4] B22C *1/16, 9/12*

U.S. Cl. 164—16 **13 Claims**

1. A method of forming a foundry mould or core comprising adding to refractory particles a binder consisting essentially of an alkali metal salt of a polybasic organic acid or of a polymerised monobasic organic acid, together with an alkaline earth metal hydroxide and calcium citrate, with the addition of at least one polyvalent metal oxide, and water, said organic acid having a pKa of not less than 2.5, said alkali metal salt solution before addition of the alkaline earth metal hydroxide having a pH of not less than 5.7, and the total weight of said alkaline earth metal hydroxide, calcium citrate, and said polyvalent metal oxide comprising between 25 and 500 per cent of the weight of said salt of said organic acid, and passing an acid gas through the resulting body.

4,588,014

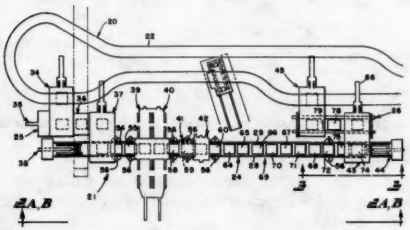
FOUNDRY MOLDING APPARATUS AND METHOD

Warren A. Blower, Brecksville, and Rudolf Hermes, Parma, both of Ohio, assignors to Osborn Manufacturing Corporation, Cleveland, Ohio

Filed Jul. 23, 1982, Ser. No. 401,114

Int. Cl.[4] B22C *9/00*

U.S. Cl. 164—29 **53 Claims**



1. A foundry molding apparatus comprising a conveyor, a cope and drag flask separate/set-on at the entry end of said conveyor operative to separate a vertically assembled cope and drag flask combination and sequentially to place one flask of such combination on said conveyor at an entry position thereof and then the other flask, a flask transfer operative positively to move and locate such one flask clear of such entry position to permit placement of such other flask on said conveyor to form a cope and drag flask set horizontally in line with previously formed cope and drag flask sets, and an index mechanism operative to index such sets and previously formed sets in abutting relationship along said conveyor through a plurality of stations for production of cope and drag molds.

44. A method of forming foundry molds comprising the steps of:

(a) separating a vertically assembled cope and drag flask combination;

(b) placing one flask of such combination on an idler conveyor at an entry position thereof;

(c) positively moving and locating such one flask along the conveyor clear of such entry position;

(d) placing the other flask of such combination on said conveyor at such entry position to form a cope and drag flask set horizontally in line with cope and drag flask sets previously formed on the conveyor; and then

(e) indexing such set and previously formed sets in abutting relation along a conveyor through a plurality of stations for production of cope and drag molds therein.

4,588,015

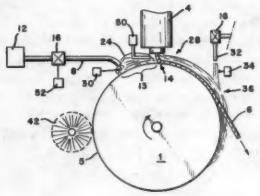
CASTING IN AN EXOTHERMIC REDUCING FLAME ATMOSPHERE

Howard H. Liebermann, Succasunna, N.J., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Oct. 17, 1984, Ser. No. 661,642

Int. Cl.[4] B22D *11/00*

U.S. Cl. 164—463 **9 Claims**



1. An apparatus for casting metal strip, comprising:

a. a moveable chill body having a quench surface thereon;

b. nozzle means for depositing a stream of molten metal on a quenching region of said surface to form said strip;

c. gas supply means for providing an initial gas mixture, which consists essentially of carbon monoxide and oxygen gases;

d. ignition means for igniting said initial gas mixture to create an exothermic reaction which provides a low density, reducing flame atmosphere at a depletion region located substantially adjacent to and upstream from said quenching region; and

e. control means for controlling said initial gas mixture to produce an adjusted reducing flame atmosphere at said depletion region, said adjusted reducing flame having a burnt gas composition which includes substantially no free oxygen, said control means comprising:

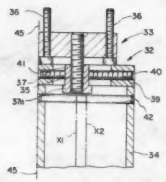
(i) temperature sensing means for sensing flame temperature; and

(ii) adjustment means for adjusting said control means to provide a casting regime in which a relative increase in the volume percent of carbon monoxide supplied within said initial gas mixture produces a corresponding, relative decrease in said flame temperature.

4,588,016
CONTINUOUS CASTING APPARATUS

Gus Sevastakis, 5645 Angola Rd., Toledo, Ohio 43615

Filed Aug. 6, 1984, Ser. No. 638,214
Int. Cl.[4] B22D *11/08*
U.S. Cl. 164—425 11 Claims



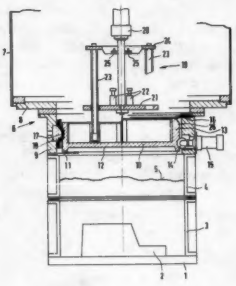
8. A continuous casting apparatus comprising
a tubular die,
a cooler associated with the tubular die,
opposed pairs of drawing rolls associated with the outlet opening of the die for drawing the cast product from the die,
one set of rolls being mounted for rotation about stationary axes,
the other set of rolls being mounted for rotation about axes movable radially with respect to the cast product,
a starting bar assembly comprising
a starter tip dimensioned to fit within the die,
an elongated starting bar adapted to extend between and be engaged by said sets of rolls and
means interconnecting the starter tip and starting bar for adjustment radially relative to one another and for holding the starter tip and starting bar in the adjusted position sufficiently that when the starter tip is inserted into the outlet opening tubular die upon start up of the casting apparatus the starting bar can be positioned so that the starting bar is tangent to the periphery of the fixed drawing rolls and the periphery of the opening and the center line of the starting bar is displaced radially with respect to the center line of the starter tip and such that the movable drawing rolls can be successively moved radially inwardly or outwardly with respect to the center line of the cast product to maintain the center line of the cast product aligned with the center line of the die.

4,588,017
APPARATUS FOR COMPACTING MOLDING SAND USING PRESSURIZED GAS

Norbert Damm, Karlsrdorf-Neuthard, and Alfons Köbel, Karlsruhe, both of Fed. Rep. of Germany, assignors to BMD Badische Maschinenfabrik Durlach GmbH, Karlsruhe, Fed. Rep. of Germany

Filed May 29, 1984, Ser. No. 614,677
Claims priority, application Fed. Rep. of Germany, May 26, 1983, 3319030
Int. Cl.[4] B22C *15/00*
U.S. Cl. 164—169 18 Claims

1. An apparatus for compaction of molding sand by gas pressure, the apparatus comprising an enclosed gas space containing gas under pressure sealed by a sealing means and a mold area located therebelow, the mold area including a mold box closed at a bottom thereof by a pattern plate with a pattern thereon, a filling frame on a top of the mold area, a space above an upper surface of the molding sand heaped on said pattern, a piston plate is disposed a short distance above the upper surface of the molding sand, said piston plate forming said sealing means of said enclosed gas space and separating said space above the surface of the molding sand from the enclosed gas space, said piston plate being freely movable under the effect of the pressure of the gas in the enclosed gas space so that the gas disposed between the piston and the molding sand becomes compressed in a range of milliseconds and the sand undergoes compaction, a circumference of said piston plate is approximately equal to an inner cross sectional area of said filling frame, means for moving the piston plate to an initial position

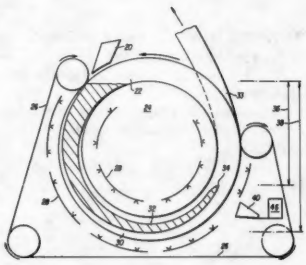


above the surface of the molding sand after the molding sand is compacted, and means for releasably locking the piston plate in the initial position.

4,588,018
CONTROL IN CONTINUOUS CASTING TO ENHANCE FEEDING

Uday K. Sinha, and Frank A. Peacock, both of Carrollton, Ga., assignors to Southwire Company, Carrollton, Ga.

Continuation of Ser. No. 592,198, Mar. 22, 1984, Pat. No. 4,552,200, which is a continuation of Ser. No. 431,439, Sep. 30, 1982, abandoned, which is a continuation of Ser. No. 220,647, Dec. 29, 1980, abandoned. This application Jul. 5, 1984, Ser. No. 627,822
The portion of the term of this patent subsequent to Nov. 12, 2002, has been disclaimed.
Int. Cl.[4] B22D *11/20, 11/22*
U.S. Cl. 164—413 8 Claims



1. A continuous casting machine for casting continuous steel strands of indefinite length, comprising:
a vertically rotating casting wheel;
a chill channel in the outer periphery of the wheel;
nozzle means for directing a stream of molten alloy into the chill channel;
means for cooling the outside of the chill channel to extract heat from the molten stream;
monitoring means for detecting solidification porosity of the cast strand and for detecting the location of the apex of the solidification zone within the solidifying strand being cast;
means for increasing casting speed until the apex is located downcourse of the lowermost wheel position if the solidification apex is not located downcourse of the lowermost wheel position; and

means for adjusting the casting speed and the cooling means according to the criteria:

(a) if porosity is present, decrease casting speed so as to shift said apex counter to the direction of casting and in the direction of increasing metalostatic pressure until formation of solidification porosity is substantially minimized; further provided that if said apex has been shifted substantially to the lowermost wheel position without achieving said minimization, then decreasing cooling sufficiently to shift said apex downcourse of the lowermost position by a selected distance and then repeating the procedure of this substep; or

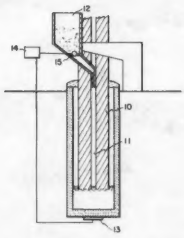
(b) if porosity is not present, increase casting speed so as to shift said apex in the direction of casting until formation of porosity impends.

4,588,019

METHODS OF CONTROLLING SOLIDIFICATION OF METAL BATHS

Joseph M. Wentzell, Ty Careg, Remsen, N.Y. 13438

Filed Apr. 17, 1984, Ser. No. 601,226
Int. Cl.[4] B22D *27/20*; C22B *9/18*
U.S. Cl. 164—470 **9 Claims**



1. A method of nucleating highly alloyed metals to control their solidification and reduce segregation by adding a solid particulate metal powder comprising the steps of:

a. melting a metal alloy to form a molten metal alloy bath;

b. providing a molten slag of controlled chemistry over the molten metal alloy bath, through which the metal powder is added to remove surface impurities without complete solution of the powder particles;

c. adding to the surface of the molten slag over the molten metal alloy bath, a solid particulate metal alloy powder of compatible composition under conditions such that the powder particulates pass through said slag and enter the molten metal while still in the solid state substantially free of surface impurities; and

d. cooling the metal to solidification.

4,588,020

SURVEILLANCE SYSTEM FOR CURVED CONTINUOUS CASTING PLANTS

Josef Waltl, Ostermiething; Fritz Gränitz, and Karl Schwaha, both of Linz, all of Austria, assignors to Voest-Alpine International Corporation, New York, N.Y.

Filed Jan. 3, 1984, Ser. No. 567,521
Claims priority, application Austria, Jan. 11, 1983, 74/83
Int. Cl.[4] B22D *11/20*
U.S. Cl. 164—454 **21 Claims**

1. A method for surveillance of a curved continuous casting plant where a curved strand exiting from a strand guide means is straightened comprising

casting the strand in a continuous mold;

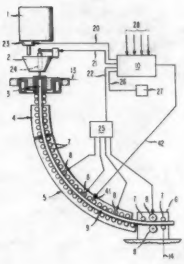
feeding the strand through a guiding means;

determining the stiffness of the strand on its path from the mold through the guiding means;

determining the allowable and permissible residual time motion parameters of the strand;

providing a signal upon exceeding of the permissible residual time motion parameters of the strand to induce appropriate steps for continuing the casting process; and

coordinating a value to each strand cross-sectional element (a, b, . . . n) momentarily passing by at a certain distance from the mold input level, which value about corresponds to the magnitude of the stiffness of the element and for the



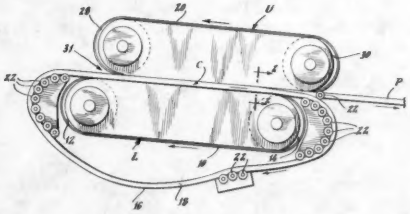
determination of which primarily the withdrawal speed of the cross-sectional element (a, b, . . . n) on its path from the mold input level to a certain distance from the mold input level is employed, such that the value determined for each element is compared with a limiting value depending on the actual withdrawal speed (v) and that the minimum positive difference from the positive differences between the limiting values and the determined values is used as a determining factor for the maximum permissible residual withdrawal time.

4,588,021

MATRIX COATINGS ON ENDLESS FLEXIBLE METALLIC BELTS FOR CONTINUOUS CASTING MACHINES METHOD OF FORMING SUCH COATINGS AND THE COATED BELTS

Norman J. Bergeron, Burlington; Wojtek S. Szczypiorski, Colchester; James G. Villa, Hinesburg, all of Vt., and S. Richard Hazelett, Provo, Utah, assignors to Hazelett Strip-Casting Corporation, Colchester, Vt.

Filed Nov. 7, 1983, Ser. No. 549,752
Int. Cl.[4] B22D *11/06*; B05D *1/02*
U.S. Cl. 164—432 **111 Claims**



30. An endless flexible casting belt for use in a continuous metal casting machine for continuously casting molten-metal, said belt having fusion-bonded to a surface thereof a protective, insulative coating comprising:

a metallic material,

a nonmetallic refractory material substantially uniformly interspersed throughout said metallic material, and

said metallic material being in the form of a matrix holding, supporting and anchoring said nonmetallic refractory

material on the belt surface, said coating having a desired accessible porosity of at least 8% of the total volume of the coating to enhance the non-wettability of the coating by molten-metal.

4,588,022

ANODIC PROTECTION SYSTEM AND METHOD

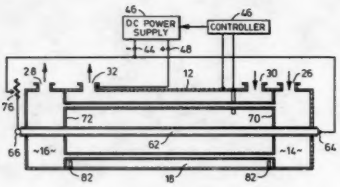
Delio Sanz, Willowdale, Canada, assignor to C-I-L Inc., Willowdale, Canada

Continuation of Ser. No. 445,999, Dec. 1, 1982, abandoned. This application Dec. 14, 1983, Ser. No. 597,806

Claims priority, application Canada, Jan. 21, 1982, 394576

Int. Cl.[4] F28F *19/00*

U.S. Cl. 165—1 **11 Claims**



1. A method of anodically protecting a heat exchanger for a corrosive fluid, said heat exchanger being of the kind having an elongated shell, a plurality of tubes within said shell, baffles within said shell, said corrosive fluid circulating in a tortuous path within said shell over the exterior of said tubes, power supply means for supplying a positive potential, means for connecting said positive potential to said shell, and a cathode extending longitudinally as one continuous cathode entirely through said shell and having a pair of ends, said method comprising controlling the potential along said cathode by applying a first negative potential to one end thereof and applying a second negative potential which is different from said first negative potential to the other end thereof to control the location along the length of said cathode of the minimum negative potential on said cathode, whereby to maintain the potential on the exterior surfaces of said tubes in the passive potential range along the length of said tubes.

4,588,023

DEVICE FOR RELEASING HEAT

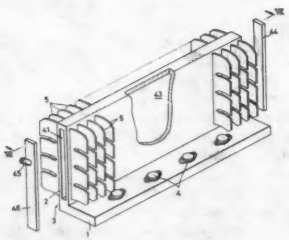
Masaaki Munekawa, Oyama, Japan, assignor to Showa Aluminum Corporation, Osaka, Japan

Division of Ser. No. 273,087, Jun. 12, 1981, Pat. No. 4,449,578. This application Feb. 17, 1984, Ser. No. 580,756

Claims priority, application Japan, Jun. 16, 1980, 55-82252; Jun. 16, 1980, 55-82253; Jun. 16, 1980, 55-82254

Int. Cl.[4] F28D *15/00*

U.S. Cl. 165—104.33 **1 Claim**



1. A device for releasing heat comprising:

(a) an extruded aluminum main body having a predetermined cross section and including a portion for attaching heat emitting elements thereto and a finned portion, and

(b) a heat pipe portion provided in the vertical wall in the main body, the main body including a horizontal wall and a vertical wall, the horizontal wall serving as the portion for attaching heat emitting elements thereto, the vertical wall being formed with fins on at least one of the opposite sides to serve as the fin portion, having the heat pipe portion substantially entirely therethrough, and the heat pipe portion is provided by a hollow portion formed in the vertical wall itself, containing a working fluid enclosed therein, closed at its opposite ends and having a vacuum interior, said hollow portion has a horizontal partition wall permitting the upper and lower parts of the hollow portion to communicate with each other at its opposite ends to thereby form a looped channel including an upper passageway and a lower passageway.

4,588,024

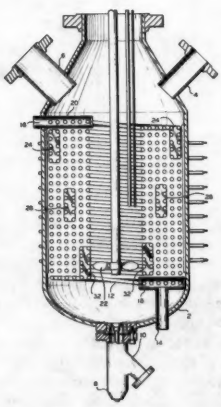
INDIRECT HEAT EXCHANGER WITH BAFFLES

Norman R. Murray, and Harold R. Hunt, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 9, 1982, Ser. No. 356,593

Int. Cl.[4] F28F *13/12, 9/22;* **F28D** *7/02*

U.S. Cl. 165—109.1 **6 Claims**



1. An indirect heat exchanger, comprising:

(a) a vertically-disposed vessel adapted to confine a first fluid;

(b) interconnected, helical tubes, adapted to confine a second fluid in indirect heat exchange with said first fluid, arranged in at least four, spaced, concentric cylinders about the axis of said vessel and at at least four, spaced, vertical levels in each of said concentric cylinders;

(c) a first plurality of vertically-disposed baffle plates, connected to adjacent tubes passing through each of a plurality of first, vertical, radial planes spaced from one another about said axis of said vessel, each of said first baffle plates being arranged in each of said first radial planes in a manner to span the radial distance between at least two said concentric cylinders and betwen at least two said vertical levels;

(d) said first plurality of baffle plates, in each of said first radial planes, being spaced from one another a radial distance equal to the distance between at least two, adjacent concentric cylinders and a vertical distance equal to the distance between at least two adjacent vertical levels;

(e) said first plurality of baffle plates being further arranged, in said first radial planes, to form a plurality of concentric

first rows of said first baffle plates at the thus spaced radial and vertical locations set forth in (c) and (d); and

(f) a second plurality of vertically-disposed baffle plates, connected to adjacent tubes passing through each of a plurality of second, vertical, radial planes spaced from one another about said axis of said vessel and alternately between said first radial planes, each of said second baffle plates being arranged in each of said second radial planes in a manner to span the radial distance between at least two said concentric cylinders and between at least two said vertical levels;

(g) said second plurality of baffle plates, in each of said second radial planes, being spaced from one another a radial distance equal to the distance between at least two adjacent concentric cylinders and a vertical distance equal to the distance between at least two adjacent vertical levels;

(h) said second plurality of baffle plates being further arranged, in said second radial planes, to form a plurality of concentric second rows of said second baffle plates at the thus spaced radial and vertical locations set forth in (f) and (g);

(i) said concentric first rows of said first baffle plates and said concentric second rows of said second baffle plates being arranged at alternate radial and vertical locations.

4. An indirect heat exchanger, comprising:

(a) a vertically-disposed vessel adapted to confine a first fluid;

(b) stirring means mounted on the axis of said vessel;

(c) interconnected, helical tubes, adapted to confine a second fluid in indirect heat exchange with said first fluid, surrounding said stirring means and arranged in at least four, spaced, concentric cylinders about the axis of said vessel and at at least four, spaced, vertical levels in each of said concentric cylinders;

(d) a first plurality of vertically-disposed baffle plates, connected to adjacent tubes passing through each of a plurality of first, vertical, radial planes spaced from one another about said axis of said vessel, each of said first baffle plates being arranged in each of said first radial planes in a manner to span the radial distance between at least two said concentric cylinders and between at least two said vertical levels;

(e) said first plurality of baffle plates, in each of said first radial planes, being spaced from one another a radial distance equal to the distance between at least two, adjacent concentric cylinders and a vertical distance equal to the distance between at least two adjacent vertical levels;

(f) said first plurality of baffle plates being further arranged, in said first radial planes, to form a plurality of concentric first rows of said first baffle plates at the thus spaced radial and vertical locations set forth in (d) and (e); and

(g) a second plurality of vertically-disposed baffle plates, connected to adjacent tubes passing through each of a plurality of second, vertical, radial planes spaced from one another about said axis of said vessel and alternately between said first radial planes, each of said second baffle plates being arranged in each of said second radial planes in a manner to span the radial distance between at least two said concentric cylinders and between at least two said vertical levels;

(h) said second plurality of second baffle plates, in each of said second radial planes, being spaced from one another a radial distance equal to the distance between at least two adjacent said concentric cylinders and a vertical distance equal to the distance between at least two adjacent said vertical levels;

(i) said second plurality of baffle plates being further arranged, in said second radial planes, to form a plurality of concentric second rows of said second baffle plates at the thus spaced radial and vertical locations set forth in (g) and (h);

(j) said concentric first rows of said first baffle plates and said concentric second rows of said second baffle plates being arranged at alternate radial and vertical locations.

4,588,025

ALUMINUM HEAT EXCHANGER PROVIDED WITH FINS HAVING HYDROPHILIC COATING

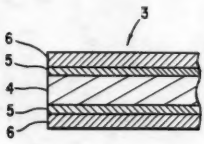
Takaichi Imai, Uji; Takeshi Yamada, Hirakata; Kunio Sakaue, Kusatsu; Eizo Isoyama, Nara; Masaaki Mizoguchi, and Katsumi Tanaka, both of Sakai, all of Japan, assignors to Showa Aluminum Corporation, Osaka, Japan

Filed Nov. 7, 1984, Ser. No. 669,170

Claims priority, application Japan, Nov. 7, 1983, 58-209508

Int. Cl.[4] F28F *13/18*

U.S. Cl. 165—133 **4 Claims**



1. A heat exchanger made of aluminum and comprising a tube and fins attached to the tube, the heat exchanger being characterized in that the fins are treated with a coating composition comprising an alkali silicate A a low-molecular-weight organic compound B having carbonyl and a water-soluble high-molecular-weight organic compound C and are thereafter dried by heating, whereby a hydrophilic coating is formed over the surfaces of the fins.

4,588,026

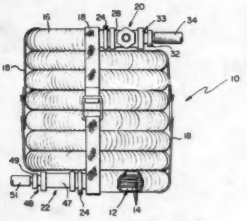
COILED HEAT EXCHANGER

William H. Hapgood, Wayland, Mass., assignor to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 47,384, Jun. 11, 1979, abandoned. This application Oct. 22, 1981, Ser. No. 313,920

Int. Cl.[4] F28F *9/02*; F28D *7/10*; F25B *27/00*

U.S. Cl. 165—158 **9 Claims**



1. A heat exchanger comprising:

a corrugated plastic tubing having opposing end portions connected to one another through an intermediate length portion of said tubing;

a bundle of flexible metal tubes extended longitudinally through said intermediate length portion of the tubing and in random lateral relationship with respect to one another and with respect to the inner surface of said intermediate length portion of the tubing, said bundle having opposing end portions disposed adjacent respective ones of said opposing end portions of the plastic tubing;

coupling means secured to respective adjacent end portions of the plastic tubing and the bundle of flexible tubes for connecting separately to the interior of the plastic tubing and to the interiors of the flexible tubes; and

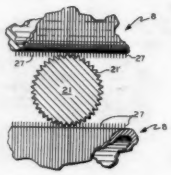
said intermediate length portion of said plastic tubing being wound helically into a coil of desired size.

4,588,027

FINNED OR SERRATED ROD BAFFLES FOR FINNED TUBE-SHELL HEAT EXCHANGER

William A. McClintock, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 12, 1982, Ser. No. 348,378
Int. Cl.[4] F28F *9/00, 9/24*
U.S. Cl. 165—159 9 Claims



1. A heat exchanger comprising

(a) a plurality of parallel tubes having circumferential fins thereon, said tubes being arranged in a plurality of parallel rows to form a bundle of parallel tubes, and

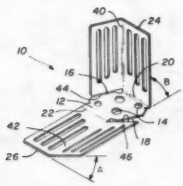
(b) at least one rod baffle comprising a plurality of parallel rods attached to an outer ring surrounding the bundle of parallel tubes, said rods positioned between adjacent parallel rows of said tubes, at least some of the plurality of rods having longitudinally extending serrations engaging the circumferential fins of the tubes in the tube rows between which they pass.

4,588,028

HEAT SINK AND METHOD OF MANUFACTURE

Larry D. Marshall, Dallas, and Marvin F. Moore, Carrollton, both of Tex., assignors to Thermalloy Incorporated, Dallas, Tex.

Filed May 6, 1985, Ser. No. 730,729
Int. Cl.[4] F28F *7/00*
U.S. Cl. 165—185 8 Claims



1. A heat sink formed from a material having a high heat transfer coefficient comprising:

a polygonal base portion having opposed, substantially parallel edges;

heat radiating means disposed at a substantially right angle to said base portion and joined to said base portion along at least one of said opposed edges; and

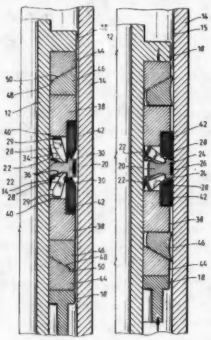
said radiating means being bent along a line disposed generally perpendicularly to said base portion and extending through an intersection between adjacent edges of said base portion whereby said radiating means is disposed within planes extending through said edges and generally perpendicularly to said base portion.

4,588,029

EXPANDABLE METAL SEAL FOR A WELL TOOL

William A. Blizzard, Houston, Tex., assignor to Camco, Incorporated, Houston, Tex.

Filed Sep. 27, 1984, Ser. No. 655,388
Int. Cl.[4] E21B *33/12*
U.S. Cl. 166—120 16 Claims



1. In a well tool having an expandable seal sealing off the space between an inner tubular member and an outer tubular member, the improvement in said seal comprising,

an annular metal ring positioned about the inner tubular member and adapted to expand outwardly for engagement with an outer tubular member, said ring including a pair of annular spaced lips on the outer periphery of the ring,

a flowable metal insert positioned between said lips for sealing against the outer member,

metal seal means on each side of the metal ring for sealing between each side of the ring and the inner member,

setting means on each side of the ring for longitudinally moving toward each other for setting the metal ring, and

outwardly movable metal means between each of the setting means and the metal ring for expanding the metal ring radially outward upon movement of the setting means toward each other.

4,588,030

WELL TOOL HAVING A METAL SEAL AND BI-DIRECTIONAL LOCK

William A. Blizzard, Houston, Tex., assignor to Camco, Incorporated, Houston, Tex.

Filed Sep. 27, 1984, Ser. No. 655,481
Int. Cl.[4] E21B *23/00, 23/02, 33/00*
U.S. Cl. 166—120 22 Claims

1. A well packer for setting in a nipple having a no-go shoulder and a locking notch comprising,

a body,

initially retracted locking means on the body, said means including actuating means for moving the locking means axially into engagement with both the top and bottom of the locking notch for locking the body against axial movement in the nipple,

metal cup sealing means on the outside of the body for sealing against the inside of said nipple, and

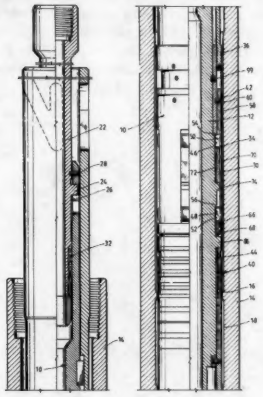
piston means on the body adapted to set the sealing means in a sealing relationship between the nipple and the body.

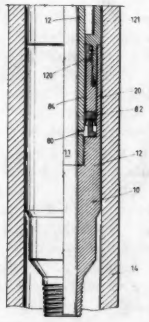
18. In a well tool having an expandable seal for sealing between an inner tubular member and an outer tubular member, the improvement in a metal seal comprising,

a plurality of metal cup sealing rings having tapering lips positioned about the inner tubular member,

a plurality of tapered expanders one of which extends into

each sealing cup and engaging the lips for wedging the lips outwardly into a sealing relationship with both the inner and the outer tubular members,





piston means adjacent one end of said plurality of rings for moving the expander and sealing ring together for wedging the lips outwardly, and

said cup rings shaped for setting in a sequential order starting with the ring furthest from the piston.

4,588,031

WELL CEMENTING PROCESS

John E. Oliver, Jr., and Arnold M. Singer, both of Clear Fluids, Inc. P.O. Box 27526, Houston, Tex. 77227

Continuation-in-part of Ser. No. 460,130, Jan. 24, 1983, Pat. No. 4,474,240, and Ser. No. 450,519, Dec. 17, 1982, Pat. No. 4,515,699. This application Jun. 18, 1984, Ser. No. 621,695

Int. Cl.[4] E21B *33/16, 37/00*

U.S. Cl. 166—291 **9 Claims**

1. A process for improved bonding in a well system between cement, and well tubular members and the formation about the well bore at a pay zone, the steps comprising:

(a) displacing at turbulent flow conditions drilling fluid materials, including mud, solids and filter cake, from the annulus between the tubular members and formation by circulating therein a slug of concentrate consisting essentially of a water-free mixture of surfactant and alcohol: and

(b) following said slug of concentrate with an aqueous fluid cement whereby said slug of concentrate removes displaceable drilling fluid materials from the annulus at the pay zone but leaving some residual filter cake on the formation, and said well tubular members and residual filter cake both residing in a surface water-wetted condition after passage of said slug whereby hardening of the cement produces an improved bonding to both the well tubular members and the formation at the pay zone.

4,588,032

FLUID SPACER COMPOSITION FOR USE IN WELL CEMENTING

Willis A. Weigand, and Patty L. Totten, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Aug. 9, 1984, Ser. No. 705,425

Int. Cl.[4] E21B *33/16*

U.S. Cl. 166—291 **16 Claims**

1. A method of emplacing an aqueous cement slurry into a well bore which contains an oil base composition having dispersed therein oil wet particles, which comprises:

introducing into said well bore and into contact with said oil based composition, a spacer composition comprising:

an aqueous fluid;

a nonylphenol admixture comprising from about 20 to about 80 percent by volume nonylphenols ethoxylated with from about 1 to about 6 moles of ethylene oxide and from about 20 to about 80 percent by volume nonylphenols ethoxylated with from about 7 to about 14 moles of ethylene oxide, present in an amount of from about 1 to about 10 percent by volume of said composition; and,

at least one member selected from the

group consisting of:

a sulfonated linear C_8 to C_{18} straight chain alcohol ethoxylated with from 2 to 20 moles of ethylene oxide;

an aliphatic glycol ether containing from about 3 to about 12 carbon atoms, and

an alcohol containing from about 3 to about 8 carbon atoms ethoxylated with from about 2 to about 4 moles of ethylene oxide, said alcohol being different from said aliphatic glycol when present, said selected member being individually present in an amount of from about 0 to about 5 percent by volume of said composition;

displacing at least a portion of said oil based composition from an area in said well bore into which said cement slurry is to be emplaced with said spacer composition;

displacing at least a portion of said spacer composition from said area in said well bore into which an aqueous cement slurry is to be emplaced with said cement slurry; and

permitting said cement slurry to set up in said area.

4,588,033

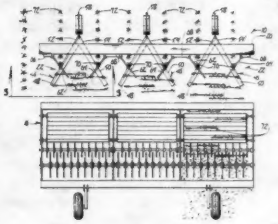
COTTON ROOT CUTTER AND SHREDDER

Henry K. Orthman, Lexington, Nebr., assignor to Orthman Manufacturing, Inc., Lexington, Nebr.

Filed Sep. 4, 1984, Ser. No. 647,173

Int. Cl.[4] A01D *13/00*

U.S. Cl. 171—62 **8 Claims**



1. A cotton root cutter and extractor tool for an agricultural

implement including forward and rearward ends, opposite sides, an elongated tool bar and means for supporting the tool bar in a working position on a prime mover, said tool comprising,

an elongated cutter blade having a cutting edge,

support means for mounting said cutter blade on and below the tool bar such that the cutter blade is positioned, in the working position of the tool bar, generally horizontally below the ground surface with the cutting edge inclined rearwardly and to one side of the implement for loosening the soil, striking a cotton root and urging it toward that one side of the implement,

an elongated trash member having a forward edge, and

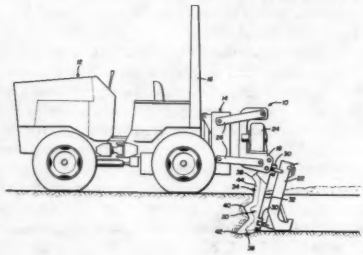
means for positioning said trash member relative to said cutter blade such that the forward edge thereof is disposed in intersecting spaced relation above the cutter blade and inclined rearwardly and to the opposite side of the implement whereby, upon forward movement of the tool to engage a cotton plant at the intersection of the cutter blade and trash member, the plant is uprooted and displaced over the top of the cutter blade transversely of the direction of travel of the tool.

4,588,034

VIBRATORY PLOW BLADE

Emil T. Leonard, and Robert G. Draney, both of Wichita, Kans., assignors to J. I. Case Company, Racine, Wis.

Filed Nov. 26, 1984, Ser. No. 674,892
Int. Cl.[4] A01B *13/08*
U.S. Cl. 172—40 **2 Claims**



1. In a vibratory plow for laying cable, pipe and the like under ground including a prime mover, an elongated plow blade mounted on a blade support frame, said blade support frame having a vibrator for transmitting orbital motion to said plow blade for forming a ground slot, the improvement comprising:

said plow blade having a leading edge, a trailing edge and a bottom edge, said leading edge being tapered and including a plurality of serrations along its length, an upper serration for cutting soil during each successive down stroke as the plow blade moves along the ground slot formed by the blade during vibration thereby relieving surface tension, an intermediate serration providing an upward fracturing force on subsoil with each successive upward stroke of the plow blade, and a lower serration providing an upward fracturing force on deep subsoil during each successive upward stroke of the plow blade;

each serration includes an upper leading edge and the upper leading edge of said lower serration being sloped to a greater extent, relative to horizontal, than the upper leading edges of the other serrations for assisting in the maintenance of a proper plowing depth; and

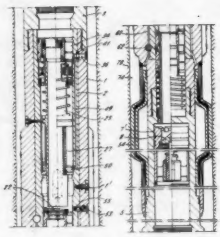
wherein the upper serration is separated from the intermediate serration by a portion of the leading edge which is generally parallel to the trailing edge of the plow blade.

4,588,035

DOWN HOLE BLOW OUT PREVENTER AND METHOD OF USE

Adrianus W. Van Gils, Loosdrecht, and Abraham V. D. Boogaart, Almere, both of Netherlands, assignors to I I. E. Innovation Enterprise Ltd., Switzerland

Continuation-in-part of Ser. No. 463,674, Feb. 4, 1983, abandoned. This application May 10, 1984, Ser. No. 608,867
Int. Cl.[4] E21B *33/127*
U.S. Cl. 175—48 **17 Claims**



1. A down-hole blow-out preventer capable of operating in conjunction with a surface blow-out preventer, comprising an elongated tubular housing having threaded end portions for connecting the housing in a drillpipe-string and a cricumferentially arranged packer element capable of being inflated outwardly, a valve arranged inside said housing at its lower end, said valve being spring loaded upwardly against a valve seat into its closing position, a flapper valve sleeve received inside said housing in sliding engagement with the housing inner wall and supported at its lower end by spring means, a flapper valve being mounted on its upper end which valve is spring loaded into its closing position in which it is in sealing engagement with the upper rim of the flapper valve sleeve but is retained in its open position by means of a flapper valve release sleeve which is mounted inside said housing for a sliding movement, which flapper valve release sleeve is provided with plunger means having inlet means in communication with the outside of said housing so that by the fluid pressure in the annulus between said housing and the bore hole-wall said plunger means with said flapper valve release sleeve are moved upwardly against the tension of a spring and said flapper valve is released and flaps into its closed position so that by a fluid pressure inside the housing acting on top of the closed flapper valve, the flapper valve sleeve is pushed downwardly into a lower position against said spring means, friction means being provided for holding said flapper valve sleeve in said lower position, while in moving downwardly said flapper valve sleeve uncovers an inlet which is in fluid communication through a check valve with said packer element for inflating said element by said fluid, and in moving over said friction means to a lower most position said flapper valve sleeve uncovers the inlet of a circulation channel which extends through the wall of said housing to the outside, which inlet is closed by a shut-off check valve, means being provided for locking said flapper valve sleeve in its lower most position and means for deflating the packer element.

17. A method of drilling using a surface blow-out preventer in conjunction with a down-hole flow-out preventer connected into a drill string, the down-hole blow-out preventer being of the kind comprising an elongate tubular housing having through bore for the passage of drilling mud and passage means extending through the housing wall, a packer element arranged circumferentially around the housing, its inner space communicating via the passage means in the housing wall with the through bore of the housing, a cylindrical valve sleeve mounted in the through bore of the housing for axial movement between a drilling position when the sleeve closes said passage means and an inflating position when the

passage means are open, means for closing the through bore of the housing comprising a one-way valve which is located in the through bore of the housing below the cylindrical valve sleeve and is operable to allow passage of mud under pump pressure through the through bore of the housing in a direction towards the drill bit and is operable automatically to prevent flow of mud in the opposite direction, valve means for closing the bore in the cylindrical valve sleeve, means for holding the valve means open in the course of running in and drilling and for automatically closing said valve means when the pressure in the through bore of the housing is reduced to a level below the pressure in the bore hole by a predetermined amount, a mud circulation channel extending through the housing wall to the through bore of the housing, means being provided to open the mud circulation channel to the through bore of the housing above the cylindrical valve sleeve when the packer element is inflated, and means to allow the packer element to be deflated when the hydrostatic head of the mud column above the packer element is sufficient to overbalance the pressure below it, wherein, on a kick being detected, said method comprises the steps of:

closing the surface blow-out preventer to seal off the bore hole at the surface;

taking at the surface a measurement of the pressure in the bore hole to determine the pressure created by the kick;

letting off at the surface the pressure in the drill string to allow said pressure to fall below the pressure in the bore hole by said predetermined amount whereby to cause said valve means to close;

reapplying the pressure in the drill string whereby to cause said cylindrical valve sleeve to move to its second position allowing inflation of the packer element by mud pressure within the drill string to seal off the bottom of the borehole and to cause said means to open the mud circulation channel;

introducing mud of an increased density into the drill string via a valve in the surface blow-out preventer whereby to circulate said mud into the annulus above the packer element via said mud circulation channel; and

continuing to circulate said mud until the hydrostatic head of the mud column in the annulus is sufficient to overbalance the pressure of the kick.

4,588,036

CONTINUOUS, UNDISTURBED SAMPLING BY ROTATIONAL BORING IN NON-PLASTIC GRANULAR TILLS

Gérard Desrochers, Ville Mercier; Louis Dubreuil, Montréal, and Joseph Grumich, St-Lambert, all of Canada, assignors to Hydro-Quebec, Quebec, Canada

Filed Sep. 22, 1983, Ser. No. 534,714

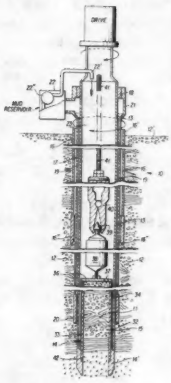
Int. Cl.[4] E21B *25/00*

U.S. Cl. 175—58 **17 Claims**

1. A boring apparatus to obtain continuous undisturbed sampling from heterogeneous non-cohesive granular till soils, said apparatus comprising a hollow drill rod having a coring bit of preselected diameter secured at a boring end thereof, drive means for rotating said drill rod at a predetermined speed and down pressure dependent on the coring bit diameter to impart rotation to said coring bit for the penetration of said drill rod in said soil at a predetermined rate, said coring bit having an annular drilling head, a plurality of fluid convection channels of preselected diameter in said annular drilling head, convection means to provide for a pressurized flow of a mud drill fluid in said hollow drill rod at a predetermined flow rate, an outer casing positioned about said drill rod and spaced therefrom to define a mud circulation annulus between said drill rod and outer casing, said drill fluid being convected to said drilling head by passage of said mud through said channels in said annular drilling head and out through said circulation annulus when said drill rod is rotated whereby said mud flow is away from said coring bit avoiding contact with the granular till projecting into said annular drilling head so as not to disturb the granular till core, said mud having a viscosity of at least 70 seconds as measured with a Marsh funnel, said mud in said drilling head being pressurized to about 140 to 175 KPa, a retractable soil sample receiving tube for insertion and retraction from said coring bit and dimensioned for receiving in close fit therein an undisturbed sample of said granular till soil and capable of retracting said sample from said hollow drill rod in an undisturbed form, and an outer soil stabilizing tube positioned about said outer casing and extending in a top portion of said soil whereby to prevent wash away about a bore drilled by said boring apparatus.

12. A method of extracting a continuous undisturbed sampling from a heterogeneous non-cohesive granular till soil comprising the steps of:

(i) boring, at a predetermined speed and down pressure dependent on a preselected coring bit diameter, an annular cavity in a soil to be sampled by means of a hollow drill rod having said coring bit with a crown annular drilling head at a boring end of said tube;



(ii) simultaneously injecting, at a predetermined flow rate, a mud drill fluid having a viscosity of at least 70 seconds as measured with a Marsh funnel in a plurality of convection channels in said annular drilling head to flow over said crown shaped drilling head;

(iii) convecting said drill fluid past said drilling head;

(iv) convecting said mud from said convection channels exteriorly of said coring bit in a circulation annulus formed between said drill rod and an outer casing positioned about said drill rod and spaced therefrom so that said mud does not contact the granular till projecting into said annular drilling head so as not to disturb the granular till core;

(v) simultaneously advancing a soil sample receiving tube suspended in said coring bit and at a predetermined rate for receiving in close fit therein an undisturbed granular till soil sample excavated by said drilling head; and

(vi) retracting said sample receiving tube from said hollow drill rod without disturbing said sample.

4,588,037

TURRET FOR ROOF BOLTING APPARATUS

Michel Combet, Caluire, France, assignor to Envirotech Corporation, Salt Lake City, Utah

Filed Dec. 11, 1984, Ser. No. 680,617

Claims priority, application France, Dec. 16, 1983, 83 20730

Int. Cl.[4] E21C *9/00*; E21D *20/02*

U.S. Cl. 175—220 **6 Claims**

1. A turret for drilling apparatus enabling the injection of resin cartridges after drilling of a hole in a roof of a mine without moving the turret, the turret comprising a drilling rod having a drilling bit at its upper end and movable toward and away from the mine roof for drilling a hole therein and a head

having a fixed member engageable with the mine roof and having a guide aperture therein, and a guide movable generally transversely of the direction of movement of the drilling rod, the movable guide having a first passage adapted to receive the drilling rod and a second passage, separate from the first, adapted to receive a cartridge of resin from a source thereof,

means for moving the guide between a drilling position, in which the first passage is axially aligned with the guide aperture in the fixed head member and with the drilling rod being movable through the first passage and the aperture, and an injection position in which the second passage is in axial alignment with the guide aperture, with a resin cartridge being movable through the second passage and the aperture.

4,588,038

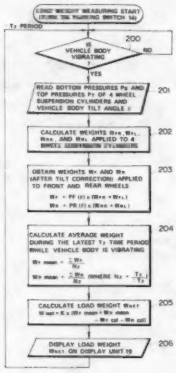
LOAD WEIGHT MEASURING METHOD

Kazuo Takagi, Hiratsuka, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Feb. 26, 1985, Ser. No. 705,883

Int. Cl.[4] G01G *19/10, 23/14, 5/04*

U.S. Cl. 177—141 **5 Claims**


LOAD WEIGHT MEASURING START (TURNING THE TRAVELING SWITCH ON)
T2 PERIOD
200
IS VEHICLE BODY VIBRATING
NO
YES
READ BOTTOM PRESSURES Ps AND TOP PRESSURES Pr OF 4 WHEEL SUSPENSION CYLINDERS AND VEHICLE BODY TILT ANGLE θ
201
CALCULATE WEIGHTS Wrr, Wrl, Wrr, AND Wrl APPLIED TO 4 WHEEL SUSPENSION CYLINDERS
202
OBTAIN WEIGHTS Wr AND Wf (AFTER TILT CORRECTION) APPLIED TO FRONT AND REAR WHEELS
203
CALCULATE AVERAGE WEIGHT DURING THE LATEST T2 TIME PERIOD WHILE VEHICLE BODY IS VIBRATING
204
CALCULATE LOAD WEIGHT
205
DISPLAY LOAD WEIGHT ON DISPLAY UNIT 10
206

1. A load weight measuring method wherein a load weight is measured by subtracting the weight of a vehicle body when it is empty from the weight when it is loaded, said vehicle body being carried by all suspension cylinders of a vehicle comprising the steps of:

sequentially detecting pressures in said all suspension cylinders during a predetermined duration of time while the vehicle is vibrating;

calculating a weight applied to said all suspension cylinders based on the detected pressure and the cross-sectional area of each cylinder; and

calculating an average value of the calculated weight during said predetermined duration of time, thereby measuring at least either one of the weight when the vehicle is loaded or the weight when the vehicle is empty.

4,588,039

VEHICLE STEERING CONTROL SYSTEM AND METHOD OF OPERATING SAME

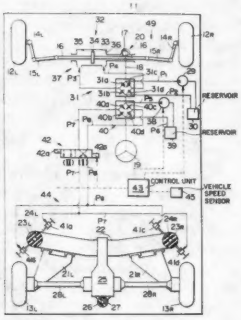
Takaaki Uno, Zama; Yasuji Shibahata, Yokohama, and Yasumasa Tsubota, Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Oct. 11, 1984, Ser. No. 659,964

Claims priority, application Japan, Oct. 17, 1983, 58-193932; Oct. 27, 1983, 58-166839[U]

Int. Cl.[4] B62D *5/06, 7/06*

U.S. Cl. 180—140 **24 Claims**



1. A method of operating a vehicle steering control system including means for providing hydraulic fluid under pressure, rear wheel control means for controllably turning rear wheels in one of first and second directions under influence of the hydraulic fluid from the hydraulic fluid providing means in response to steering effort applied to a steering wheel, the first and second directions being opposite to each other relative to their neutral position in which the steering wheel is in its straight ahead position, flow control means for changing flow characteristics of the hydraulic fluid from the hydraulic fluid providing means to the rear wheel control means, the flow control means capable of substantially stopping supply of the hydraulic fluid to the rear wheel control means, and means for causing turning direction of the rear wheels to change between the first and second directions when operated,

said method comprising a step of operating said causing means upon said flow control means substantially stopping the supply of hydraulic fluid to the rear wheel control means.

4,588,040

HYBRID POWER SYSTEM FOR DRIVING A MOTOR VEHICLE

Harold D. Albright, Jr., 2201 Providence Rd., Charlotte, N.C. 28211, and William R. Rollins, 30 Dawn Dr., South Windsor, Conn. 06074

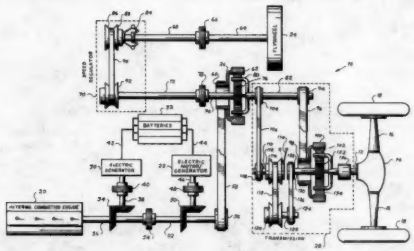
Filed Dec. 22, 1983, Ser. No. 564,742

Int. Cl.[4] B60K *9/04*

U.S. Cl. 180—165 **16 Claims**

1. A hybrid power system for driving a motor vehicle comprising: electric storage battery means; an electric motor/generator; means for connecting said battery means to said motor/generator for driving said motor/generator from said battery means or for charging said battery means from said motor/generator; flywheel means for accumulating, storing and discharging kinetic energy; a variable drive transmission; means connecting said electric motor/generator and said flywheel mens to said drive transmission; said electric motor/-generator and flywheel connecting means being selectively operable to drive said transmission from said motor/generator and flywheel means in combination; said drive transmission being operable to apply a braking load that develops braking

energy which is transmitted by said transmission means to said electric motor/generator and flywheel connecting means being operable to transmit said braking energy to said motor/-generator to charge said battery means and to said flywheel means, for accumulating kinetic energy in said flywheel means;



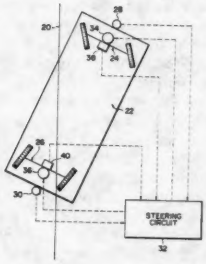
and speed regulating means operable to maintain a substantially constant rotational input speed to said electric motor/-generator and flywheel connecting means from said flywheel means in response to variations in the rotational speed of the output from said flywheel means.

4,588,041

VEHICLE FOR DRIVING ALONG A LEAD LINE

Toshio Tsuchihashi, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 22, 1984, Ser. No. 592,281
Claims priority, application Japan, Mar. 29, 1983, 58-51450
Int. Cl.[4] B60K *26/00*
U.S. Cl. 180—168 **5 Claims**



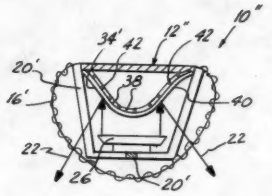
1. A vehicle which is driven along a lead line, comprising:
a main body having a front and rear wheels which are independently steered;
first and second position detecting means which are mounted to front and rear portions of said main body and include means for respectively detecting deviations from the same lead line; and
steering means for individually steering said front and rear wheels in accordance with outputs from said first and second position detecting means.

4,588,042

PARABOLIC SPEAKER

Timothy J. Palet, and George Spector, both of 233 Broadway Rm. 3615, New York, N.Y. 10007

Filed Jul. 23, 1984, Ser. No. 633,654
Int. Cl.[4] H05K *5/00*
U.S. Cl. 181—153 **1 Claim**



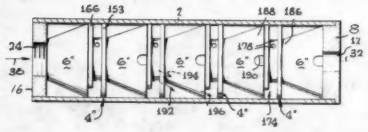
1. A speaker system which comprises:
(a) an elongated cabinet having an acoustically open front end grille and a curved rear reflecting surface of parabolic configuration; and
(b) a speaker invertably mounted on and within said surface so that sounds would be reflected back in straight lines from said parabolic rear reflecting surface to a listener at a wider and fuller range, wherein said rear surface of said cabinet is adjustable, wherein its shape can be changed to form variations in said sound patterns reflected back to said listener, wherein said adjustable rear surface comprises:
(a) a plurality of vertical slat members pivotably mounted to each other, with each end slat member pivotably mounted to said cabinet; and
(b) a flexible acoustically reflective cover removeably positioned in front of said slat members to form a continuous reflecting surface.

4,588,043

SOUND SUPPRESSOR FOR A FIREARM

Charles A. Finn, 3204 Production Ave, Suite 1, Oceanside, Calif. 92054

Continuation-in-part of Ser. No. 479,690, Mar. 28, 1983. This application Dec. 20, 1984, Ser. No. 684,350
Int. Cl.[4] F16K *47/02*; F16L *55/02*
U.S. Cl. 181—223 **10 Claims**



1. A sound suppressor for a firearm, comprising:
a hollow cylindrical casing having an entrance end and an exit end;
at least one disc-shaped baffle element coaxially mounted within said casing and between said ends, said element having front and rear faces with an annular area therebetween and with at least one opening in said rear face;
a centrally apertured entrance end plug attached to the entrance end of said casing and including means for mounting said sound suppressor to the muzzle of a firearm; and
a centrally apertured exit end plug attached to the exit end of said casing;
said baffle element having a primary opening therethrough with at least one slanted sidewall and at least one secondary opening arranged between said annular area and said slanted sidewall.

4,588,044

HAWAII TRAPEZE SPREADER BAR

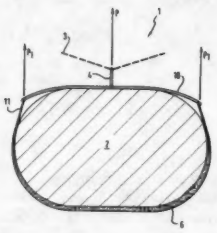
Klaus Mader, Waging, Fed. Rep. of Germany, assignor to Reinhard Mader, Petting, Fed. Rep. of Germany, a part interest

Continuation of Ser. No. 427,932, Sep. 29, 1982, Pat. No. 4,474,261. This application Sep. 27, 1984, Ser. No. 637,135

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1981, 3140668

Int. Cl.[4] B63H 9/10

U.S. Cl. 182—3 **9 Claims**



1. In a Hawaii trapeze support device having a hook for suspending a person wearing the support device on a rope, wherein said person wearing said support device is suspended in a substantially horizontal position and is retained in said support device at the upper torso by means of a transverse belt wrapped around the upper torso of said person, the improvement comprising a substantially rigid spreader bar having an exterior side and means on said exterior side for attaching a portion of said belt across said exterior side of said spreader bar, said means for attaching said portion of said belt comprising a slot at each end of said spreader bar, wherein said portion of said belt is passed through each slot for securing said belt to said spreader bar, and a hook member for attachment to said rope connected to said spreader bar between the ends of said spreader bar and extending over said portion of said belt extending across said exterior side of said spreader bar, a pair of substantially parallel raised marginal portions each at an edge of said spreader bar and extending substantially the whole length of said spreader bar, said raised marginal portions confining therebetween the portion of said belt extending across the exterior side of said spreader bar, wherein the length of said spreader bar corresponds approximately to the width of a human chest for preventing lateral forces to the right and to the left of the chest of said person in said support device.

4,588,045

DESCENT CONTROL DEVICE

Roy D. Walker, Sr., 3518 Mitchell, St. Joseph, Mo. 64507

Filed Nov. 5, 1984, Ser. No. 668,334

Int. Cl.[4] A62B 1/14

U.S. Cl. 182—5 **7 Claims**

1. A descent control device for lowering a person from a first location, at a place of significant height, to a second location substantially lower; said descent control device comprising:

(a) an elongate strap having a first end and a second end;

(i) said strap being a substantially flat, thin, elongate strap of rectangular cross-section with first and second opposite sides and first and second edges;

(ii) said strap being foldable therealong, and folded, so as to define a strap loop;

(b) a first attachment member mounted on said strap at a first location along said strap;

(i) said first attachment member being a first member of hook and eye means;

(c) a brake block having a channel passing therethrough;

(i) said brake block channel being substantially rectangular in cross-section with a wide dimension and a narrow dimension defining first and second opposite, wide inner surfaces;

(ii) said channel having a first end and a second end and being sufficiently large to permit a doubled portion of said strap to pass therethrough, with said strap first side being generally parallel to, and in overlapping alignment with, said channel wide inner surfaces;

(iii) said strap loop being formed in said strap between said first strap location and said strap second end, said loop being extended through said channel so that said loop extends outwardly from said first end of said block channel and so that said first and second ends of said strap extend from said second end of said block channel with said strap first side facing, and generally overlapping, said block channel wide inner surfaces as said strap twice passes through said channel;

(d) a friction ring in engagement with said loop;

(i) said ring having two oppositely spaced sidewalls, and top and bottom oppositely spaced endwalls having a diameter larger than said narrow dimension; said top-end wall being elongate and substantially longer than said brake block channel is wide in its widest dimension;

(ii) said friction ring being mounted on said strap loop with said strap passing therethrough and with said ring top end aligned generally along said brake block channel wide dimension, so that diverging tension on said first and second ends of said strap tends to pull said ring and said block toward one another and generally frictionally contact and bite a portion of said strap therebetween;

(iii) said ring having gate means associated therewith facilitating mounting said ring on, or dismounting said ring from, said loop;

(e) whereby said strap may be trapped between said ring top end and said brake block along said block channel first end, and further, said strap being trapped by said ring top end extending in a direction generally laterally across said channel wide dimension; and,

(f) whereby, for a first mode of operation, said device is prepared for use by: anchoring said strap first location near said place of height and extending said strap second end downwardly therefrom; and, sliding said block and ring along said strap to a position accessible by said descending person; and in use in said first mode: said person to be lowered is secured to said ring; and, said person slides down said strap by said ring, the rate of descent being controlled by forces tending to generate friction between said strap and each of said ring and said block; and

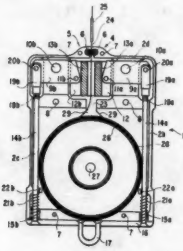
(g) whereby, for a second mode of operation; said assembly is preapred for use: by attaching said ring to said place of height, by sliding said block into a position substantially near said ring and by adjusting said strap to have said first attachment member accessible to said descending person; and in use in said second mode, said person to be lowered is secured to said first attachment member and lowered thereby, with the rate of descent being controlled by forces tending to cause frictional interaction among said strap, said block and said ring, said friction permitting controlled movement of said strap through said ring by a second person.

4,588,046

DEVICE FOR LOWERING A LOAD ALONG A LINE

Abram P. van der Neer, Krimpen a/d Ijssel, and Harm W. Holman, Doetinchem, both of Netherlands, assignors to van der Neer International B.V., Doesburg, Netherlands

Filed Nov. 5, 1984, Ser. No. 668,332
Claims priority, application Netherlands, Feb. 6, 1984, 8400368
Int. Cl.[4] A62B *1/14*
U.S. Cl. 182—236 1 Claim



1. A device for controlledly lowering a load, of the type comprising a load supporting belt having one end portion at which there is a first eye, and a housing wherein the remainder of the belt, in an unextended looped condition, is normally enclosed, said housing having front and rear walls at edgewise opposite sides of the belt, opposite top and bottom ends, and opposite side walls, and having an opening in its top end through which said end portion of the belt extends and through which the remainder of the belt is withdrawn upwardly from the housing under opposing forces exerted at said first eye and at a second eye at the bottom end of the housing, said device being characterized by:

A. said housing having in its interior a defined zone which is spaced inwardly from its said ends and from its said side walls and wherein said remainder of the belt is normally confined;

B. a pair of levers in said housing, each having an inner end and an outer end,

(1) each said lever being medially fulcrummed, for up and down swinging of its ends, upon a pivot which is fixed in the housing inwardly adjacent to the top end thereof and which is spaced inwardly a substantial distance from one of said side walls and a greater distance from the other side wall,

(2) each said lever having its outer end adjacent to the side wall that is nearer its pivot and having its inner end opposingly adjacent to the inner end of the other lever;

C. A pair of brake shoes, one for each said lever, each said brake shoe

(1) having a belt engaging surface that opposes and is adjacent to the belt engaging surface on the other brake shoe and

(2) having a pivotal connection to the inner end of its lever whereby upward swinging of the inner ends of said levers clampwise engages the brake shoes with the belt;

D. a pair of tension rods, one for each of said levers, each said tension rod being inwardly adjacent to a side wall of the housing and having at an upper end thereof a pivotal connection with the outer end of its lever;

E. a transverse member at the bottom end of the housing to which the lower end of each said tension rod is connected, said transverse member

(1) being confined to limited up and down motion relative to the housing and

(2) having said second eye fixed thereto so that downward force on said second eye, transmitted through the tension rods and the levers, applies belt clamping force to the brake shoes; and

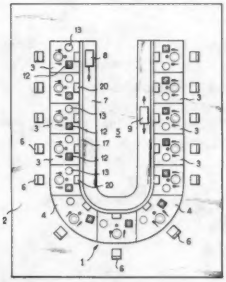
F. a compression spring surrounding each tension rod and reacting between it and the housing to bias the tension rod downwardly, said springs thus maintaining belt clamping force on the brake shoes when no load is applied to said second eye.

4,588,047

QUICK-MEAL RESTAURANT INSTALLATION

Olivier de Reynal de Saint Michel, 14 rue des Anciens Beliers, 78730 Rochefort en Yvelines, France

Filed May 22, 1984, Ser. No. 613,398
Claims priority, application France, May 27, 1983, 83 08784
Int. Cl.[4] E04H *3/04*
U.S. Cl. 186—38 5 Claims



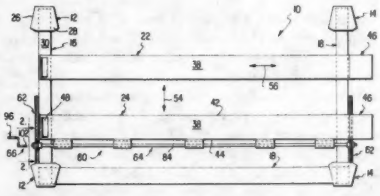
1. A quick-meal restaurant installation comprising in a room open to customers, a furniture unit adapted to define a service space on one side of said unit, seats for the use of customers on the other side of said unit, the furniture unit being made up of modules assembled together, each module comprising a portion forming a table, said table having a surface having cooking means comprising at least one electric hotplate adapted to operate as a meat grill, and at least one electric deep-fryer; there being at least one said seat opposite each module, a beverage dispenser for dispensing a plurality of beverages, supported by a console and suspended above the table, said beverage dispenser comprising push-buttons adapted to be depressed by the customer for selecting different hot and cold drinks, and a suction hood mounted above the hotplate and the deep-fryer for evacuating fumes generated by the cooking.

4,588,048

FOUR POST LIFT AND TRACK ADJUSTING MEANS THEREFOR

Saulo V. Rodriguez, McAllen, Tex., assignor to Economove Corporation, McAllen, Tex.

Filed Mar. 19, 1984, Ser. No. 590,988
Int. Cl.[4] B60S *13/00*
U.S. Cl. 187—8.67 14 Claims



1. In a vehicle lift of the type having vertical support means

comprising first and second pairs of vertical supports, first and second beams extending between the first and second pairs of supports, first and second vehicle supporting tracks mounted on the first and second beams, means for simultaneously raising and lowering the beams relative to an underlying ground surface, means mounting the tracks for movement toward and away from each other to accommodate vehicles of different width, the mounting means allowing skewing movement between the track, the improvement comprising means for constraining the first track for linear movement toward and away from the second track and for moving the first track linearly toward the second track including

a rack carried by each of the first and second beams and a pair of pinions carried by the first track in meshing engagement with the racks;

a shaft interconnecting the pinions for simultaneous rotation; and

means for rotating the pinions.

4,588,049

DOUBLE PANEL SLIDING DOOR, ESPECIALLY FOR ELEVATORS

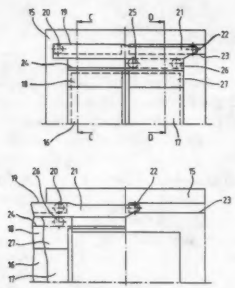
Max Haas, Kriens, Switzerland, assignor to Inventio AG, Hergiswil, Switzerland

Division of Ser. No. 479,656, Mar. 28, 1983, Pat. No. 4,564,087. This application Sep. 3, 1985, Ser. No. 772,008

Claims priority, application Switzerland, Apr. 2, 1982, 2040/82

Int. Cl.[4] B66B *13/00*

U.S. Cl. 187—56 **2 Claims**



1. A double panel sliding door for a transportation system, especially for passenger and cargo elevators and the like, having a door frame, comprising:

a pair of panels;

a panel suspension and guiding arrangement provided for each panel of said pair of panels;

at least one of said panel suspension and guiding arrangements comprising:

a fixedly positioned roller mounted at the door frame;

a guide rail movable in conjunction with a related one of said pair of panels;

said movable guide rail being displaceable over said fixedly positioned roller;

an arm carried by said related panel;

a movable roller mounted at an end of said arm;

a fixed guiding rail mounted at the door frame and provided with two opposite rail parts between which said movable roller is displaceable;

said pair of panels moving in the same direction to define a telescopic double panel sliding door arrangement;

one of said panels having a shorter displacement than the other panel having a longer displacement;

the panel suspension and guiding arrangement containing the fixed and movable guiding rails being operatively associated with the panel having the shorter displacement which defines a slow moving panel;

a guiding rail mounted at the slow moving panel having the shortest displacement; and

said panel having the longest displacement being provided with rollers moving on said guiding rail mounted at the slow moving panel having the shortest displacement.

4,588,050

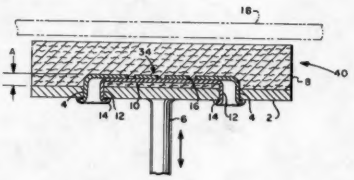
BRAKE SHOE ASSEMBLY

John A. Urban, Plainwell, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Dec. 17, 1984, Ser. No. 682,626

Int. Cl.[4] F16D *69/04*

U.S. Cl. 188—73.1 **7 Claims**



1. A brake shoe for frictionally braking a moveable member, said show comprising a support member adapted to be moved towards and away from the moveable member and having a frictional lining removably secured to a side thereof facing towards the moveable member that is made from a material adapted to frictionally brake the moveable member when urged thereagainst by the support member, said lining secured to the support member by at least one hollow tubular retainer having a base portion in embedded securement in the lining having at least a portion thereof flattened and having at least one pair of spaced-apart hollow tubular legs that extend in a direction towards the support member and thence through corresponding openings therethrough to respective ends thereof that are adapted to removably secure the lining to the support member to facilitate removal of the liner.

4,588,051

DISC BRAKE

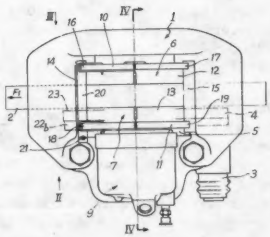
Jean-Claude Mery, Pavillons sous Bois, France, assignor to Societe Anonyme D.B.A., Paris, France

Filed Dec. 12, 1983, Ser. No. 560,649

Claims priority, application France, Dec. 23, 1982, 82-21687

Int. Cl.[4] F16D *55/224, 69/04*

U.S. Cl. 188—73.32 **3 Claims**



1. A disc brake comprising a caliper mounted to slide parallel to the axis of the brake disc on a fixed support (4), inner and outer friction pads located in the caliper on either side of the disc and mounted to slide parallel to said axis, a rectangular assembly orifice delimited by two guide edges parallel to the axis of said disc and provided in the caliper to allow passage of active parts of the friction pads, each lining-holder plate of the

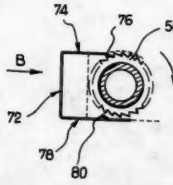
pads having a bearing nose opposite a corresponding guide edge, a transverse key capable of being introduced between a guide edge of the caliper and corresponding bearing noses of the two plates to prevent any untimely radial movement of the pads, and a control motor mounted on an inner part of the caliper and capable of stressing the inner pad in the direction of the outer pad which bears against the caliper, characterized in that, the caliper (1) is mounted on the fixed support by means of a single column parallel to the axis of the brake disc, the linining-holder plate of the inner pad incorporates, under the guide edge remote from the column, a semicircular pivoting lug and, under the guide edge adjacent the column a curved contour located within a circle the radius of which is equal to a distance between a pivot axis of said lug and a lower bearing ridge of the adjacent guide edge, and the fixed support having, underneath the guide edge (14) remote from the column, a semicylindrical locking receptacle the axis of which is parallel to the axis of the brake disc and which is open towards the guide edge adjacent the column and capable of receiving said pivoting lug, the transverse key being engaged above said locking receptacle between the corresponding guide edge and bearing noses of the two brake pads.

4,588,052

DRUM BRAKE

Pierre Courbot, Villiers le Bel, France, assignor to Societe Anonyme D.B.A., Paris, France

Continuation of Ser. No. 392,821, Jun. 28, 1982, abandoned. This application Oct. 23, 1984, Ser. No. 664,085
Claims priority, application France, Jul. 10, 1981, 81 13592
Int. Cl.[4] F16D *65/40*
U.S. Cl. 188—79.5 P **3 Claims**



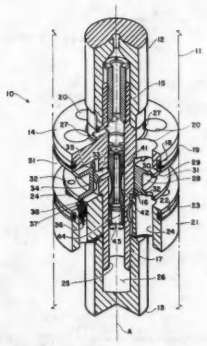
1. A drum brake with automatic adjustment of the friction elements, comprising two brake shoes equipped with friction elements capable of being urged into frictional engagement with a rotating drum, applying means for urging said friction elements into engagement with the drum and arranged between two first ends of the brake shoes, a fixed anchor block disposed between two other ends of the brake shoes, spacer means for adjustably positioning said shoes and mounted near the applying means with ends of the spacer means bearing on said shoes, said spacer means comprising a device which lengthens automatically as a function of the wear of the friction elements and including a screw-nut system controlled by a pawl of an articulated arm in position for actuating a ratchet wheel, deflection movement of said arm and pawl increasing as the distance between the drum and brake shoes increases, characterized in that said spacer means has a variable rate of operation wherein the articulated arm includes an auxiliary portion positioned for actuating the ratchet wheel when the increased deflection movement of the articulated arm reaches a predetermined displacement, the pawl and auxiliary portion being in position so that the ratchet wheel is actuated during both deflection and return movements of the articulated arm when said predetermined displacement occurs, the rate at which the friction elements are brought nearer to the drum being increased in response to the occurence of said predetermined displacement and without an increase in the number of deflection movements, the articulated arm comprising a U-shaped portion with two limbs and a connecting member therebetween, the pawl formed on one limb and the auxiliary portion forming the other limb, the auxiliary portion including a projection extending from said auxiliary portion and for actuating said ratchet wheel, the pawl and projection each having an end for engaging the ratchet wheel and the ends being positioned asymmetrically on the limbs of the articulated arm, the asymmetrically positioning comprising the respective ends being positioned at different longitudinal distances from the connecting member of the articulated arm, and the variable rate of operation comprising two different speeds of moving the friction elements nearer to the drum as a function of the distance of the friction elements from said drum.

4,588,053

MULTIPLE RATE SHOCK ISOLATOR DAMPING VALVE

Robert M. Foster, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 19, 1984, Ser. No. 651,961
Int. Cl.[4] F16F *9/34*
U.S. Cl. 188—275 **4 Claims**



1. A direct acting, hydraulic shock isolation system, comprising:

(a) a hydraulic cylinder including means defining a closed reservoir at each end thereof, said cylinder containing a hydraulic fluid;

(b) a piston disposed for slidable movement within said cylinder, said piston comprising first and second axially spaced portions sized for sealing engagement with the inner surface of said cylinder, said first and second portions connected by an intermediate third axial portion of said piston of reduced outer diametric size relative to said first and second portions;

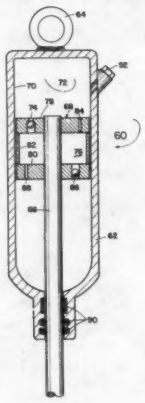
(c) each said first and second portions including means defining a predetermined number of axial holes therethrough of predetermined size for displacement of said fluid from one side of said piston to the other in response to said movement of said piston through said fluid within said cylinder;

(d) an annular member of outer diameter smaller than said first and second portions slidably disposed on said third portion and restrained for axial movement between limits defined by the confronting surfaces of said first and second portions, said annular member including a pair of confronting peripheral flanges, each of said flanges including means defining axial holes therethrough, smaller in size and corresponding in number to said predetermined number of axial holes in said first and second portions and disposed in substantially registering alignment therewith; and

(e) means for releasably engaging said annular member on said third portion in response to movement of said piston through said fluid, said means for releasably engaging said

annular member including a spring loaded radial pin slidably disposed in the wall of said third portion and engaging said annular member in the inner diameter thereof, and a shuttle valve slidably disposed on said third portion for releaseably engaging said spring loaded radial pin in response to movement thereof on said third portion.

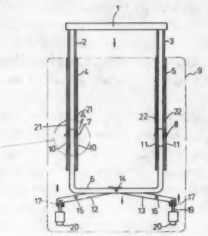
4,588,054
LINEAR MOTION DAMPER
Chester F. LeBaron, 65 Spring St., Goshen, N.Y. 10924
Filed Jul. 11, 1979, Ser. No. 56,446
Int. Cl.[4] F16F *9/49, 11/00*
U.S. Cl. 188—280 **10 Claims**



1. A fluid-actuated movement damping device which comprises a hollow sleeve member, a piston reciprocably disposed within said sleeve member, said piston having as an integral part thereof a single, continuous, void free, tubular, metallic, laterally expansible wall for locking said sleeve member and said piston against relative axial movement therebetween, said locking means comprising said hollow sleeve member, said laterally expansible wall, and a source of fluid pressure adapted to expand said wall into locking position, said source being actuated to supply said fluid pressure upon axial reciprocation of said piston relative to said sleeve.

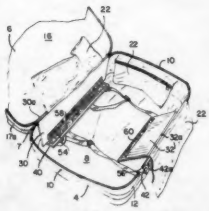
4,588,055
DEVICE FOR TOWING LUGGAGE
Tzu L. Chen, No. 26-2, Lane 96, Hsin Lung Rd., Section 2, Taipei, Taiwan
Filed Mar. 19, 1985, Ser. No. 713,606
Int. Cl.[4] A45C *5/14, 13/38*
U.S. Cl. 190—18 A **2 Claims**

1. A device for towing luggage comprising:
a pair of fixed tubes spacedly attached to a wall of the luggage;
a pair of push-pull tubes each of which is inserted slidably into one of said fixed tubes;
a handle bar which is connected to the upper ends of said push-pull tubes;
a U-shaped tube having its ends connected to the lower ends of said push-pull tubes;
a pair of levers one end of each being hinged on the middle of said U-shaped tube, and the middle parts of said levers being pivoted to the wall of said luggage;
a pair of reversed L-shaped links having their upper ends respectively pivoted to the other ends of said levers and



the angled part of each link pivoted to the wall of said luggage; and
a pair of wheel units mounted on the lower ends of said links.

4,588,056
COLLAPSIBLE ARTICLE OR LUGGAGE
L. Harrison Bernbaum, 470 Madison, Glencoe, Ill. 60022
Filed Apr. 16, 1984, Ser. No. 600,836
Int. Cl.[4] A45C *7/00, 13/04*
U.S. Cl. 190—107 **7 Claims**



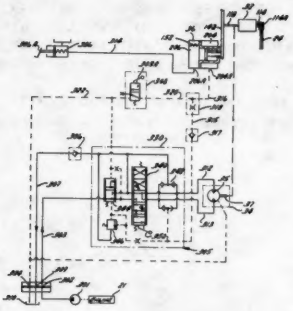
1. A collapsible article of luggage comprising:
body means having a pair of opposed panels, said opposed panels being separated by two opposed pairs of interconnected walls defining the width of the body means and an article receiving compartment formed therein;
at least one erecting panel being arranged for operative positioning adjacent said compartment of said body means, said at least one erecting panel being manipulatable to cause said at least one panel to assume an erect configuration or a collapsed configuration; said at least one panel being pivotally attached at an edge portion to said body means along a first axis perpendicular to the width of said body means,
said at least one panel being pivotally attached for movement to extend along said width in said erect configuration and to fold approximately against one of said opposed panels in said collapsed configuration,
anchor means for releasably anchoring a portion of said at least one erecting panel in said erect configuration;
said means for releasably anchoring comprises a corresponding rigid panel pivotally retained at an edge portion along a second axis lying generally parallel to said first axis, said rigid panel having attachment means arranged to cooperate with corresponding attachement means on said at least one erecting panel.

4,588,057

LOADED HYDRAULICALLY ACTUATABLE PISTON AND CONTROLS SYSTEM THEREFOR

Debra L. Weich, Fox Point, Wis., and William J. Pratt, Spring Grove, Ill., assignors to Kobe Steel Ltd., Kobe, Japan

Filed Apr. 25, 1983, Ser. No. 488,370
Int. Cl.[4] B60K *41/20*
U.S. Cl. 192—3 R 11 Claims



1. A hydraulic brake comprising:

a cylinder housing having a first bore therein which is open at one end;

an outer brake piston slidably movable in said first bore and protrudible through said open end, said outer brake piston having a second axial bore therethrough;

an inner brake piston slidably movable in said second axial bore;

each of said pistons having a retracted position and an extended position;

first biasing means between said cylinder housing and said outer brake piston for shifting the latter in one direction to extended brake-apply position wherein said outer brake piston protrudes a predetermined distance out of said first bore;

second biasing means between said outer brake piston and said inner brake piston for shifting the latter in a direction opposite to said one direction to retracted position;

a brake plate mounted for movement relative to said cylinder housing and extending into the paths of movements of said pistons for engagement by said pistons as the latter move to respective extended positions;

a first chamber in said cylinder housing defined between said cylinder housing and said outer brake piston for receiving hydraulic fluid which effects movement of said outer brake piston from extended brake-apply position to retracted brake-release position against the bias of said first biasing means; and

a second chamber in said cylinder housing defined between said cylinder housing and said inner brake piston for receiving hydraulic fluid which effects movement of said inner brake piston from retracted brake-release position to extended brake-apply position.

4,588,058

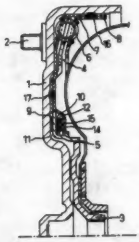
DEVICE FOR DAMPING THE VIBRATIONS OF A FLEXIBLE CLUTCH IN WET CONDITIONS, NOTABLY FOR TORQUE CONVERTER

Ali Aliouate, Vincennes, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Sep. 6, 1983, Ser. No. 529,782
Claims priority, application France, Sep. 7, 1982, 82 15192
Int. Cl.[4] F16D *47/02*
U.S. Cl. 192—106.2 4 Claims

1. In a flexible coupling integrated in an hydrokinetic torque converter for outputting to a gear box with power derivation the derivated portion of the power through an auxiliary output shaft without transiting through said torque converter, said torque converter comprising a rotatable housing with a substantially flat bottom, said housing containing a half toroidal turbine shell, said coupling comprising a pair of external parts which are driven by said housing and are formed to provide spring housings therebetween, helical compression springs held captive in said spring housings, an internal part which is located between the external parts and is connected to said auxiliary output shaft; and, a damping device for dampening oscillating movement between said housing and said auxiliary output shaft; said damping device including an indexed washer, a corrugated flexible washer and friction linings mounted on annular friction zones on opposite faces of said internal part, one of said friction linings being engageable by one of said washers, the improvements wherein

said spring housings of said coupling are located in a peripheral space located between said flat bottom of said housing and said half toroidal shell,



said damping device of said coupling is located in a central space located between said flat bottom of said housing and said half toroidal shell,

said internal part has holes formed at locations which lie in a narrow intermediate space located axially between said flat bottom of said housing and said half toroidal shell and radially between said peripheral and central spaces, and

a washer support plate in said central space, said washer support plate having:

(a) a bearing part which bears against said corrugated flexible washer,

(b) means engaged with said indexed washer to prevent rotation thereof, and

(c) portions which extend through said holes and are connected to said flat bottom of said housing in said intermediate space.

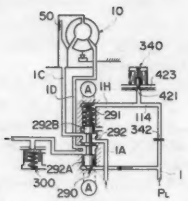
4,588,059

LOCK-UP CLUTCH CONTROL SYSTEM FOR AUTOMATIC TRANSMISSIONS

Nobuaki Miki, Kariya; Shinya Nakamura, Toyota, and Kazuhiko Shibata, Anjo, all of Japan, assignors to Aisin-Warner Kabushiki Kaisha, Anjo, Japan

Continuation-in-part of Ser. No. 354,928, Mar. 5, 1982. This application Jun. 21, 1982, Ser. No. 390,347
Int. Cl.[4] B60K *41/02*
U.S. Cl. 192—3.28 2 Claims

1. Lock-up clutch control system for an automatic transmissions comprising a lock-up control valve and a solenoid valve, wherein, said solenoid valve controlled by an electric control circuit producing output signals according to operating conditions of a vehicle and supplies a solenoid pressure to said lock-up control valve, said lock-up control valve supplied with a line pressure and said solenoid pressure in opposite fluid chambers for engaging and releasing a lock-up clutch, wherein said lock-up control valve being constructed to satisfy the following conditions (5) and (7)



$$\frac{A_2}{A_1} > \frac{PL(\max) - F/A_1}{Ps(\max)} \quad (5)$$

$$F/A_1 < PL(\min) \quad (7)$$

where A_1 is a land area of a spool for receiving the line pressure, A_2 is a land area for receiving the solenoid pressure, F is the force of a biasing spring and which is applied to the same direction as solenoid pressure, PL is the line pressure, and Ps is the solenoid pressure.

4,588,060

COUPLING FOR DRIVE SHAFT AND SERVO-MOTOR DRIVEN SHAFT WITH UNCOUPLED NEUTRAL POSITION

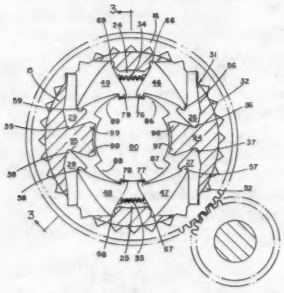
Peter Norton, 170 Beaver Brook, Lincoln Park, N.J. 07035

Filed Apr. 5, 1984, Ser. No. 597,077

The portion of the term of this patent subsequent to Jul. 10, 2001, has been disclaimed.

Int. Cl.[4] F16D *11/06*; B62D *5/04*

U.S. Cl. 192—43.2 **15 Claims**



1. A drive transmitting coupling for coupling a control member and a drive transmitting member with a driven member, said coupling comprising:

a first one-way clutch for coupling said drive transmitting member with said driven member for transmitting driving effort in one direction, a second one-way clutch for coupling said drive transmitting member with said driven member for transmitting driving effort in an opposite direction, both of said clutches being disengaged when said control member is in a central position relative to said driven member,

a first engaging means for engaging said first one-way clutch in response to movement of said control member in said one direction from said central position relative to said driven member,

and a second engaging means for engaging the second one-way clutch in response to movement of said control member in said opposite direction from said central position relative to said driven member,

whereby said driven member can be driven by said drive transmitting member only in the direction of movement of the control member from its central position relative to said driven member.

4,588,061

CLUTCH RELEASE BEARING ASSEMBLY, COUPLING MEMBER FOR SAME AND INSTALLATION AND REMOVAL METHODS FOR SAME

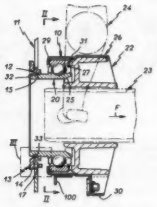
Bernard Mallet, Wittelsheim, France, assignor to Valeo, Paris, France

Filed Apr. 23, 1984, Ser. No. 603,287

Claims priority, application France, Apr. 26, 1983, 83 06847

Int. Cl.[4] F16D *19/00*

U.S. Cl. 192—98 **28 Claims**



1. Clutch release bearing assembly comprising a coupling member adapted to couple a clutch release bearing to a clutch release device of a clutch and to be attached to said clutch release device, said clutch release bearing having a drive member, attachment means disposed between and adapted to couple together said coupling member and said drive member in the axial direction from said clutch release device to said clutch release bearing, said attachment means comprising an annular retaining groove in a selected one of said coupling member and said drive member, a radially elastically deformable annular coupling ring at least partially radially engaged in said retaining groove, a generally transverse driving bearing surface on the nonselected one of said drive member and said coupling member against which said coupling ring is adapted to bear in the axial direction, and wherein said selected one of said drive member and said coupling member further comprises at least one peg projecting away from said driving bearing surface relative to said coupling ring and having a retraction surface which is generally oblique relative to the axis of the assembly angling away from said driving bearing surface.

4,588,062

TORSION DAMPING ASSEMBLY FOR AUTOMOTIVE FRICTION CLUTCH PLATE

Andreé Caray, Valence, and Pierre Loizeau, Ville D'Avray, both of France, assignors to Valeo, Paris, France

Filed Jul. 12, 1983, Ser. No. 513,078

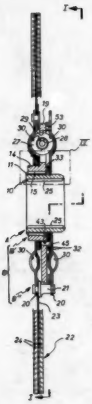
Claims priority, application France, Jul. 12, 1982, 82 12219

Int. Cl.[4] F16D *47/02*

U.S. Cl. 192—106.2 **12 Claims**

1. A torsion damping assembly for an automotive clutch, said torsion damping assembly comprising at least two coaxial parts mounted for relative rotation within a predetermined range of angular displacement, circumferentially acting resilient means circumferentially interposed between said coaxial parts, said circumferentially acting resilient means comprising at least one resiliently deformable arm circumferentially extending from an arm support member fixed for rotation with one of said coaxial parts, said resiliently deformable arm having a free end attached to the other of said coaxial parts, a pair of axially spaced transverse surfaces being provided on each of

said coaxial parts, and said arm support member being disposed axially between the respective pairs of transverse surface for



maintaining the axial position of said coaxial parts relative to each other.

4,588,063

SUPPLY CHUTE FOR SUPPLYING EMPTY BOBBINS TO A SPINNING FRAME

Tsutomu Miyazaki, Kariya; Tatemi Fukuda, Chita, and Kazuya Yoshimine, Kariya, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Jan. 27, 1984, Ser. No. 574,841
Claims priority, application Japan, Jul. 15, 1983, 58-129099
Int. Cl.[4] B65G *11/08*
U.S. Cl. 193—27 **3 Claims**

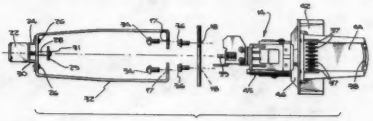
1. A supply chute for supplying empty bobbins is substantially horizontal position to a bobbin reserve unit disposed above an empty bobbin transport conveyor on a spinning frame, said bobbins having uniform predetermined length and tapered circular configuration providing uniform large and small diameters of each bobbin, said supply chute comprising a sequentially arranged plurality of vertical chute sections each providing a chute opening having dimensions for slidable passage of only one horizontally disposed bobbin at a time therethrough, and a plurality of substantially lateral chute sections each respectively disposed between, and projecting a lateral distance from sequentially adjacent ones of said vertical chute sections, each said lateral chute section having a chute opening whose dimensions are substantially the same as those of the chute opening of each said vertical chute section and having a predetermined length, and the vertical height of each said vertical chute section being shorter than said predetermined length of one of said bobbins and greater than said lateral projecting distance and the length of each said lateral chute section.

4,588,064

COIN SLIDE BRACKET AND FLANGE ADAPTER FOR A VENDING MACHINE

Jim M. Monfredi, Los Angeles, Calif., assignor to PWS Company, Los Angeles, Calif.

Filed Oct. 30, 1984, Ser. No. 666,333
Int. Cl.[4] G07F *5/04*
U.S. Cl. 194—238 **1 Claim**



1. A coin handling assembly for insertion into a coin-operated machine, comprising, in combination;

a horizontally disposed coin slide mechanism having vertical coin slots and interchangeable cores;

a vertically disposed adapter plate and bracket assembly for attachment to a generally vertical housing of the machine, having an aperture within which said coin slide mechanism is received;

said coin slide mechansim having a movable slide and being responsive to the insertion of a predetermined set of coins to permit said slide to be manually slidably moved into the interior of the machine for depositing the coins, and having a return spring for then automatically returning said movable slide;

an adapter bracket having an open looped configuration with its open end attached to said adapter plate and bracket assembly, and its closed end extending beyond and around the space into which said slide mechanism travels;

a start switch carried by the closed end of said adapter bracket;

a start switch activator pin slidably supported by said closed end of said adapter bracket, and operable when moved toward said start switch for turning said start switch on;

a coin slide activator pin carried by the forward end of said movable slide of said coin slide mechanism for selectively engaging said start switch activator pin;

a handle on the rearward end of said movable slide;

whereby when the predetermined set of coins is inserted and said handle is pushed forward, the coins are deposited inside the machine, said coin slide activator pin engages said start switch activator pin for turning said start switch on, and said return spring then returns said movable slide to its initial position; and

a second return spring associated with said start switch activator pin for returning it to its initial position.

4,588,065

ESCALATOR WITH CONTROLLED BRAKE

Charles W. Maiden, Brentwood; Ernest F. Conroy, Jr., Penn Hills, both of Pa., and John G. Dorman, Randolph, N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 27, 1984, Ser. No. 644,754
Int. Cl.[4] B65G *43/00*
U.S. Cl. 198—323 **7 Claims**

1. An escalator, comprising:

a conveyor;

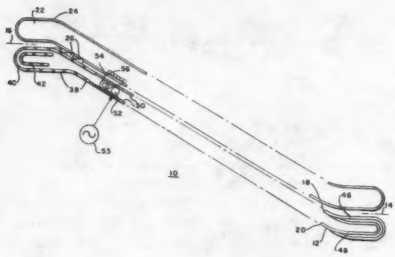
sensor means for providing an actual speed signal responsive to the speed of said conveyor;

stop means for providing an initiation signal when it is required to stop said conveyor;

first and second reference means for respectively providing a reference speed signal having first and second portions;

said first reference means being responsive to said actual speed signal and to said stop means, said first reference means including first means responsive to said actual speed signal for causing the first portion of said reference speed signal to closely track, without exceeding, the actual speed signal, prior to the initiation signal, and second means for holding the first portion of said reference speed signal constant after said initiation signal;

said second reference means being responsive to said actual speed signal, the first portion of said reference speed signal, and to said stop means, said second reference means including ramp means which, when activated,



terminates the first portion of said reference speed signal and initiates the second portion which declines at a predetermined rate, said second reference means further including means for activating said ramp means, subsequent to the initiation signal, upon equality between the actual speed signal and the first portion of the reference speed signal;

control means responsive to said actual speed signal and to said reference speed signal, said control means comparing said reference speed signal and said actual speed signal and providing a control signal in response to said comparison;

and brake means responsive to said control signal for providing a braking action which controls the speed of said conveyor such that said actual speed signal closely tracks said reference speed signal while said reference speed signal is declining at said predetermined rate.

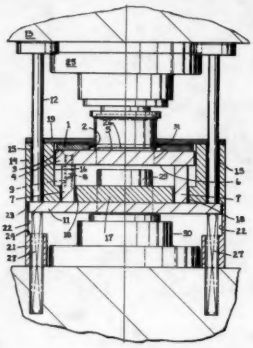
4,588,066

ARTICLE FEEDING APPARATUS WITH NON-FLEXING BELT

Elton G. Kaminski, Sidney, Ohio, assignor to The Stolle Corporation, Sidney, Ohio

Filed Jul. 26, 1984, Ser. No. 634,868
Int. Cl.[4] B65G *35/00*
U.S. Cl. 198—345 **11 Claims**

1. In an apparatus having an upper tool, an endless belt positioned beneath said upper tool and passing around at least two cylindrical drums, and having means for intermittently driving at least one of said drums for feeding a series of articles along a path so as to present them in succession to a plurality of operating stations where operations are performed on said articles in sequence, said belt having a series of equally spaced article receiving apertures slightly larger than said articles, said apparatus including a single pad positioned immediately beneath the endless belt to support said articles, said pad being supported by at least one vertical member, said vertical member being secured to a horizontal member in such a manner that said vertical member is positioned between said pad and said horizontal member, and means to move said pad in a vertical manner when desired, said means comprising at least one actuator pin, said acutator pin being secured at one end to said horizontal member and at an opposite end to said upper tool so that the vertical movement of said upper tool is synchronized



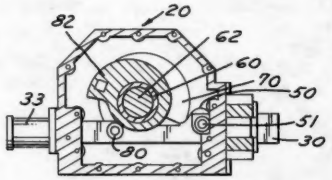
with the vertical movement of said pad when performing various operations on each of the articles.

4,588,067

WORKPIECE CLAMPING MECHANISM FOR MULTIPLE STATION TRANSFER MACHINES UTILIZING ROTARY DRIVE

John H. Brems, Apt. 11-G, 2800 S. Ocean Blvd., Boca Raton, Fla. 33432

Filed Dec. 12, 1983, Ser. No. 559,622
Int. Cl.[4] B65G *47/00*
U.S. Cl. 198—345 **8 Claims**



1. In a multiple station transfer system in which workpieces are progressively transferred from station to station in said system and in which said workpieces are individually clamped in each station by movable clamp means, a unified mechanism for clamping said workpieces in the individual stations, which comprises:

(a) one of more rotary clamp modules mounted in each station and in which each said rotary clamp module comprises:

(1) a housing,

(2) an elongate rotary input member journalled in said housing,

(3) an output member mounted in said housing for movement along a predetermined lineal path transverse to said input member and operatively associated with said clamp means,

(4) a primary cam follower member mounted on said output member and cooperating with a

(5) primary rotary cam means mounted on said input member to rotate with said input member,

(6) a secondary return cam follower member mounted on said output member spaced along said output member from said primary cam follower and cooperating with a

(7) secondary rotary return cam means mounted on and

rotated with said input member and spaced axially along said input member from said primary cam means,

(8) elastic drive means operatively interconnecting said input member and said cam means, and

(b) reversible rotary drive means mounted on said machine and operatively connected with multiple said input members and multiple said elastic drive means of said multiple rotary clamp modules.

4,588,068

PARISON TRANSFERRING MEANS

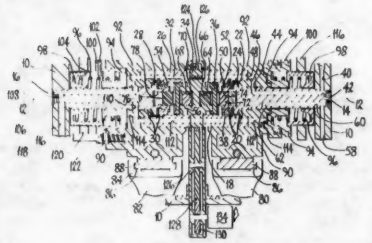
Hermann H. Nebelung, Zurich, Switzerland, assignor to Emhart Industries, Inc., Farmington, Conn.

Filed May 14, 1984, Ser. No. 610,054

Claims priority, application United Kingdom, May 21, 1983, 8314143

Int. Cl.⁴ B65G *47/24*

U.S. Cl. 198—403 **6 Claims**



1. Parison transferring means for use in transferring glass parisons from a parison forming mould of a glassware container manufacturing machine to a further mould of the machine in which the parison is formed into a container, the transferring means comprising gripping means operative to grip a parison at a gripping position of the gripping means and to release the parison at a releasing position of the gripping means, and moving means operative to move the gripping means between its gripping and releasing positions by moving the gripping means about a horizontal axis of rotation, the moving means comprising a fixedly mounted shaft extending along the axis of rotation, a cylinder mounted on an end portion of the shaft for rotation about said axis, the gripping means being mounted on said cylinder, a piston movable in said cylinder by fluid under pressure introduced into the cylinder, the piston being connected to the cylinder by a driving connection which causes rotation of the cylinder about said axis when the piston rotates about said axis, and a piston rod fixed to said piston, there being a screw-threaded connection between the piston rod and the shaft such that, when the piston moves in the cylinder, the screw-threaded connection causes the piston to rotate about said axis thereby causing the cylinder and the gripping means to rotate about said axis.

4,588,069

APPARATUS FOR SINGLING ASSEMBLY PARTS

Walter Sticht, Karl-Heinrich-Waggerl-Strasse 8, Attnang-Puchheim A-4800, Austria

Continuation of Ser. No. 659,040, Oct. 10, 1984, abandoned, which is a continuation of Ser. No. 591,899, Mar. 21, 1984, abandoned, which is a continuation of Ser. No. 306,096, Sep. 25, 1981, abandoned. This application Oct. 8, 1985, Ser. No. 786,153

Claims priority, application Austria, Sep. 30, 1980, 4864/80

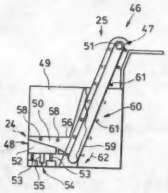
Int. Cl.⁴ B65G *47/12*

U.S. Cl. 198—443 **8 Claims**

1. An apparatus for singling entangled assembly parts which comprises

(a) a storage container for receiving a mass of randomly entangled assembly parts,

(b) a chute laterally adjacent the storage container and the storage container opening into the chute whereby the chute receives clusters of the mass of entangled assembly parts from the storage container, the chute comprising a stationary portion having an edge forming an outlet and a slide portion arranged for sliding displacement substantially perpendicularly to the stationary chute portion and the storage container for moving respective ones of the received clusters of the entangled assembly parts relative to the stationary chute portion and the storage container, wherein a discharge edge of the storage container leading to an upper edge of the chute extends in a first direction and the chute extends in a second direction enclosing an angle with the first direction, the slide portion being downwardly inclined with respect to the discharge edge and being displaceable for sliding by the discharge edge of the storage container whereby the slide portion performs a shearing action with respect to the discharge edge of the



storage container and separates respective ones of the clusters from the entangled assembly parts in the storage container, the slide portion thereby consitituting a first mechanical loosening device which lifts and loosens parts out of the clusters whereby the parts are at least partially disentangled,

(c) a second mechanical loosening device, the second loosening device comprising a stationary conveyor belt support and a revolving conveyor belt mounted thereon and extending over the width of the stationary chute portion at the outlet edge thereof and a series of entrainment elements affixed to the conveyor belt, the outlet edge extending between the slide portion and the entrainment elements and leading to the entrainment elements on the conveyor belt, the entrainment elements being arranged to receive the at least partially disentangled assembly parts, the conveyor belt and entrainment elements loosening and lifting the parts whereby the parts are disentangled, and

(d) the conveyor belt leading to an outlet for singled ones of said disentangled assembly parts.

4,588,070

BAG TRANSFER DEVICE

David A. Smith, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

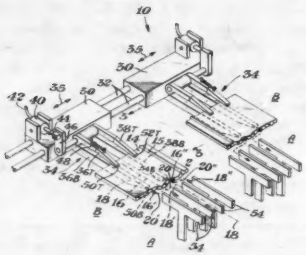
Filed Nov. 13, 1984, Ser. No. 670,515

Int. Cl.⁴ B65G *47/22*

U.S. Cl. 198—468.3 **5 Claims**

1. A device for clamping and transferring a stack of plastic bags of varying size and including zipper profiles from one location to another comprising pairs of clamping jaw assemblies, means for moving each pair of clamping jaw assemblies in more than one direction in the same plane to accommodate transfer of the stacks of plastic bags from one location to another, said means for moving including means for causing the center line of one size of plastic bags to substantially coincide

with the center line of differently sized plastic bags at least towards the end of the path of travel from one location to



another of the plastic bags without changing the path of travel of the zipper profiles of said plastic bags.

4,588,071

CHAIN CONVEYOR WITH DIVERGING INTERLEAVED SCRAPERS

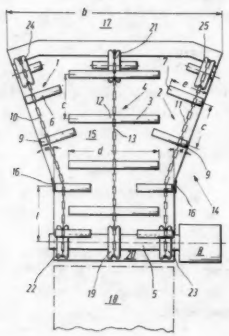
Friedrich Kleiböhmer, Kamen, Fed. Rep. of Germany, assignor to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

Filed Oct. 3, 1984, Ser. No. 657,299

Claims priority, application Fed. Rep. of Germany, Oct. 12, 1983, 3337045

Int. Cl.[4] B65G *65/06*

U.S. Cl. 198—516 **4 Claims**



1. A load conveyor for a cutting machine, the load conveyor comprising: two endless, outer chains (**1, 2**) and at least one endless further chain (**4**) positioned between the two outer chains, each of the chains carrying scrapers (**3, 6, 7**), and all of the chains being driven, via a common drive drum (**5**), by a drive station (**8**) in a direction to convey mined mineral pieces toward the drive drum, wherein the scrapers of each pair of adjacent chains interdigitate in the manner of the teeth of a zip fastener, at least in the zone of the drive station, wherein outer end portions (**9**) of the scrapers of the outer chains are connected to the outer chains, and middle portions (**12**) of the scrapers of the further chain are connected to the further chain, wherein all the chains have fixed paths of movement and extend substantially parallel to one another in a zone of the drive station, and wherein the outer chains diverge away from the further chain at a predetermined distance (**1**) from the drive station.

4,588,072

SCRAPER CHAIN CONVEYOR TROUGH WITH REINFORCING PLATE

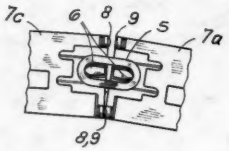
Gert Braun, and Ernst Braun, both of Essen-Heisingen, Fed. Rep. of Germany, assignors to Halbach & Braun, Fed. Rep. of Germany

Continuation of Ser. No. 231,805, Feb. 5, 1981, abandoned. This application Apr. 21, 1983, Ser. No. 487,143

Claims priority, application Fed. Rep. of Germany, Feb. 9, 1980, 3004892

Int. Cl.[4] B65G *19/28*

U.S. Cl. 198—735 **7 Claims**



1. A trough and plate combination for a scraper chain conveyor, comprising:

a trough having side walls on opposite lateral sides thereof, opposite trough ends and side wall bottom edges;

a flat reinforcing plate fixedly secured to each of said side walls extending partly from one trough end to another and having upper and lower edges as well as opposite butt ends, a lower edge of each plate extending below a bottom edge of each respective side wall;

an upper and a lower spherical socket member having a partial spherical socket connected to each plate adjacent a respective upper and lower edge thereof and at one of said butt ends;

an upper and a lower spherical ball member having a partial spherical ball connected to each plate adjacent a respective upper and lower edge thereof and at an opposite one of said butt ends, so that a plurality of said troughs are assembled with at least one partial spherical ball of a plate of one trough engaged in a partial spherical socket of a plate of an adjacent trough in the assembly; and

means for holding adjacent troughs against each other positioned between each upper ball and socket member and each lower ball and socket member so that each partial spherical ball and engaged socket forms centering elements between adjacent troughs;

each socket member being flush with respective upper and lower plate edges, with one of said opposite trough ends, and with an outer surface of at least one of said plates.

4,588,073

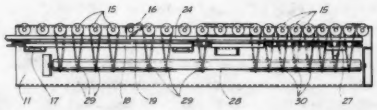
PADDED CHAIN LIVE ROLLER CONVEYOR

Donald E. Abell, Chesterfield, Mo., assignor to Alvey Inc., St. Louis, Mo.

Filed Sep. 26, 1984, Ser. No. 654,141

Int. Cl.[4] B65G *13/06*

U.S. Cl. 198—781 **9 Claims**



1. In an article conveyor having live rollers supporting the articles, the improvement of means for rotating the live rollers comprising:

(a) a roller chain made up of rollers mounted on axles and

interconnected by links engaged at said axles of the rollers, said roller axles being oriented generally vertical and said links lying in generally horizontal planes such that the roller chain has flexibility in the horizontal plane and is able to traverse curves in such plane;

(b) a high friction pad means having a friction surface for presentation to the live rollers, and said pad having a base presented to said links at one side of said rollers and formed with a series of holes aligned on the axis of said pad and penetrating said base; and

(c) means for attaching said pad to said roller chains, said attaching means being extensions on said roller axles adapted to be received in said holes in said pad base.

4,588,074

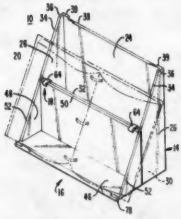
HOLDER FOR STORING AND SUPPORTING ARTICLES

David W. Strong; Patricia A. McGinnis, both of Seattle; James D. Peterson, Bellevue; Steven A. Ballmer, Seattle, all of Wash.; Vern L. Raburn; Dorothy L. Hall, both of Lincoln, Mass., and David A. Fleck, Auburn, Wash., assignors to Microsoft Corporation, Bellevue, Wash.

Continuation of Ser. No. 527,451, Aug. 29, 1983, abandoned. This application Mar. 21, 1985, Ser. No. 715,040

Int. Cl.[4] B65D *43/16*; A47B *97/04*

U.S. Cl. 206—45.15 **6 Claims**



1. A box for containing a manual during shipment and storage and for supporting the manual during use, the manual having bound material contained within a cover, the cover protruding and extending below the bound material to define a lower lip when the cover is opened and the bound material of the manual is being read, the box comprising in combination:

said box for containing the manual, the box having a front wall, a rear wall, a bottom wall, a top wall and two side walls;

a hinge for opening the box, said hinge located on the front wall having a hinge axis half the distance from the top wall and bottom wall along the front wall;

the hine joining the box in two discrete sections including a container portion and a cover portion;

the cover portion including the top wall, the top half of the front wall and two wedge-shaped portions of the side walls;

the cover portion when open disposing the top wall coplanar to the bottom wall with the wedge-shaped sections of the side walls attached to the cover portion cooperating with the remaining side walls attached to the container portion to form from the opened cover portion and adjoined container portion a slanting support surface for supporting the manual in a reading position;

the top wall having a latch portion, the latch portion protruding downwardly from the inside surface of the top wall into the plane of the rear wall when the cover portion is in the closed position;

the latch portion of the top wall protruding upwardly from the inside surface of the top wall to form a retaining edge when the cover portion is in the open position;

the lower lip of the manual cover being receivable at the latch portion to maintain the manual cover against the base of the wedge-shaped sections of the side walls whereby the manual when removed from the box can be supported in the reading position with the lower lip held by the latch portion on the top wall while the cover of the manual rests against the wedge-shaped sections of the side walls.

4,588,075

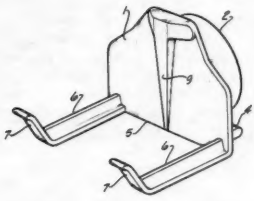
PORTABLE SOAP HOLDER

Robert W. Rupp, 2802 Holiday Pines, Traverse City, Mich. 49684

Filed Aug. 12, 1985, Ser. No. 764,664

Int. Cl.[4] A47K *5/08*

U.S. Cl. 206—77.1 **6 Claims**



1. A support for a generally rectangular bar of soap adapted to retain the bar with minimum contact on the support and to allow the bar to freely drain, comprising:

(a) a pair of elongated, horizontally aligned arms spaced from one another and extending parallel to one another;

(b) upwardly directed flanges formed on each arm at common ends;

(c) a support rib extending vertically upward, midway between the arms in a plane that extends between the ends of the arms opposite the ends carrying the flanges, the rib having a planar surface, slightly inclined with respect to the vertical, extending upwardly in a direction toward the flanged ends of the arms, and terminating at a height above the upper horizontal surfaces of the arms by a distance greater than half the major dimension of said soap bar, whereby said soap bar may be retained on the support in an attitude slightly inclined to the vertical, with one of its sides in contact with the top of the inclined rib and two points on its lower end in contact with the arms.

4,588,076

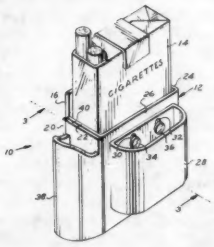
SMOKERS CONVENIENCE CADDY

Mario A. Caputo, 4905 Ave. "M", and Jeffrey C. Caputo, 4903 Ave. "M", both of Brooklyn, N.Y. 11234

Filed Nov. 7, 1983, Ser. No. 549,568

Int. Cl.[4] B65D *85/10*; A24F *15/08, 19/10*

U.S. Cl. 206—86 **1 Claim**



1. A smoker's convienence caddy comprised of a combination of detachable component units made of plastic material and formed into a compartmentalized composite structure

including a base unit adapted for accommodating a package of cigarettes, said base unit defining a front wall, a rear wall, a pair of end walls and a bottom wall with said rear wall having an adhesive backing for removably attaching the base unit to a support surface, said rear wall further extending said front wall and said end walls for providing a maximum adhesive bonding area, an ash container, said ash container including aperture engagement means, said front wall of the base unit including a mounting support adapted for interlocking connection with the aperture engagement means for releasably supporting the ash container on the base unit, a lighter pod adapted for accommodating a cigarette lighter, said lighter pod having a substantially planar rear wall, a curved front wall, said rear pod wall having a width dimension substantially conforming to the end wall of the base unit, said lighter pod further including a bottom wall extending between the curved front pod wall and rear pod wall to provide an enclosure having an open end opposite the bottom pod wall, said rear pod wall having adhesive bonding means for selectively attaching the lighter pod either to the end wall or a planar support surface, said rear pod wall further having a height dimension greater than said curved front pod wall for providing a maximum adhesive bonding area, said curved front pod wall being convex and extending to the bottom pod wall for defining an enclosure adapted to accommodate a cigarette lighter having an oval cross-sectional shape, said curved front pod wall further defining a recessed portion proximate to the open end, said recessed portion providing finger grip access for withdrawing the cigarette lighter from the lighter pod, whereby said several components are adapted for alternate independent utilization.

4,588,077

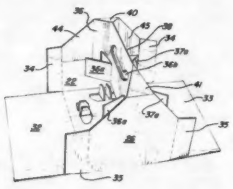
CARRIER HANDLE

Charles L. Champlin, Rittman, Ohio, and Arthur A. Olson, Jr., Glenview, Ill., assignors to Packaging Corporation of America, Evanston, Ill.

Continuation of Ser. No. 46,195, Jun. 6, 1979, abandoned. This application Nov. 25, 1981, Ser. No. 324,850

Int. Cl.⁴ B65D *75/00*

U.S. Cl. 206—193 **6 Claims**



1. A handle and carrier combination for accommodating a plurality of articles arranged in a pair of substantially parallel coextensive rows, said combination being formed from a single blank of foldable sheet material and comprising a pair of end panels of unitary single ply construction arranged in spaced, opposed, substantially upright relation for disposition adjacent opposite ends of the article rows; a hand-gripping unit spanning the distance between said end panels and foldably connected to corresponding upper portions of said end panels, said unit having a portion thereof projecting above a plane defined by the upper portions of said end panels; a base panel of unitary single ply construction for supporting and subtending the article rows and having first peripheral segments foldably connected to and substantially coextensive with corresponding lower peripheral portions of said end panels and disposed in spaced subtending relation with respect to said hand-gripping unit; and side panels of unitary single ply construction foldably connected to and substantially coextensive with opposed second peripheral segments of said base panel and extending upright therefrom for disposition adjacent corresponding article rows being secured to said end panels and coacting therewith to form a chamber having a substantially open top delineated by substantially continuous walls integral with and extending upright from said base panel; said hand-gripping unit including a pair of foldably connected elongated panel sections disposed in substantially face-to-face relation and effecting at least partial separation of the chamber into contiguous compartments, said panel sections having corresponding upper portions thereof foldably interconnected, each compartment being adapted to accommodate a row of articles; the face-to-face panel sections substantially spanning the distance between said end panels and defining a substantially upright plane intersecting planes formed by said upright end panels, the upright plane of said panel sections being in spaced relation with respect to said upright side panels, and gusset sections, each gusset section being interposed the upper portion of an end panel and the folding connection between the panel sections and having first peripheral segments foldably connected to the panel sections and a second peripheral segment foldably connected to the upper portion of an adjacent end panel.

4,588,078

PACKAGE FOR FOOD PRODUCTS, PARTICULARLY SWEET PRODUCTS

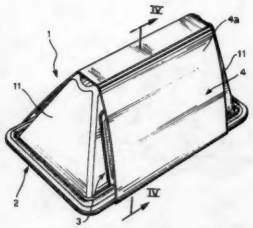
Pietro Ferrero, Brussels, Belgium, assignor to Ferrero S.p.A., Alba, Italy

Filed Feb. 6, 1985, Ser. No. 698,848

Claims priority, application Italy, Feb. 6, 1984, 52950[U]; Nov. 27, 1984, 54087[U]

Int. Cl.⁴ B65D *85/72, 85/78, 81/32*

U.S. Cl. 206—216 **16 Claims**



1. Package for food products, comprising first and second containers for respective fillings of a solid or solidifiable food product and a food product usable as a garnishing for the solid or solidifiable product, wherein:

the first container is generally dish-shaped and has a flanged rim with a pair of opposing parallel straight sides, the first container further including a first pair of flat side walls which converge on each other towards a bottom of the first container in an arrangement in which planes containing the first pair of side walls intersect along an imaginary line extending parallel to said straight sides of the rim, the first container further including a straight bottom edge located adjacent the bottom of the container and parallel to the straight sides of the rim, one of said straight sides of the rim and said bottom edge together defining one flat side wall of said first pair of flat side walls, the first container further including a second pair of mutually opposing end walls;

the second container is generally flat and has dimensions such as to allow it to be applied against said one flat side wall of the first container, the second container being at least partly compressible in order to expel the garnishing product contained therein, and

the containers have an associated tubular wrapper which can be fitted onto the first container with the second container applied to said one flat side wall, in an arrangement such that one section of this wrapper extends between a straight rim edge of said one straight side of the

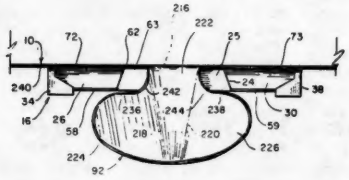
rim and the straight bottom edge to define a space together with said one of the flat side walls and said one of said straight sides of the rim, within which the second container fits, and to cover the second container, wherein the wrapper can slide over the first container parallel to the imaginary line of convergence of said walls.

4,588,079

COUPON AND COVER FOR MULTIPLE UNIT CONTAINER PACKAGES

James S. Bader, Lakewood, Colo., assignor to Adolph Coors Company, Golden, Colo.

Continuation-in-part of Ser. No. 292,811, Aug. 14, 1981, Pat. No. 4,423,810. This application Nov. 17, 1983, Ser. No. 552,606
The portion of the term of this patent subsequent to Jan. 3, 2001, has been disclaimed.
Int. Cl.[4] B65D *71/00*
U.S. Cl. 206—158 **16 Claims**



1. An apparatus for securing and covering a group of cans comprising:

molded clip means disposed in at least one interstitial opening between end portions of a plurality of cans for securing said plurality of cans in a group, said molded clip means having a central opening suitable for insertion of a finger;

cover means coupled to said molded clip means comprising:

main body means for placement over at least part of said end portions of said group of cans;

locking tab means formed in said main body means for locking said cover means to said clip means and holding said cover means in interlocking engagement with said clip means;

fold line means for allowing said locking tab means to be displaced from said main body means and inserted in said central opening of said clip means;

resilient hinge means disposed on said locking tab means for providing resilient fold lines between a central portion and ear portions of said locking tab means which causes said ear portions to fold relative to said central portion about said resilient fold lines during insertion of said locking tab means in said central opening of said molded clip means and to resiliently outwardly expand to engage a lower surface portion of said molded clip means such that ear portions are held in an expanded position in interlocking relationship with said clip means.

4,588,080

STAGED DETERGENT/FABRIC TREATING PREPARATION FOR USE IN WASHING MACHINES

Martin E. Ginn, 9327 N. Kostner, Skokie, Ill. 60076

Filed Jan. 7, 1985, Ser. No. 689,455
Int. Cl.[4] B65D *25/08*
U.S. Cl. 206—219 **6 Claims**

1. A unitary packet for use in a machine for washing soiled fabric,

said packet comprising an open top receptacle having a fluid-impervious floor and a circumambient wall joined thereto and extending upwardly therefrom,

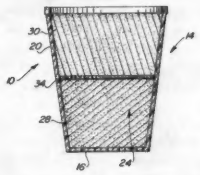
a fabric washing and conditioning article in the form of a multi-layer plug-like laminate bonded to said container against said base and said wall thereof,

said laminate including a fabric conditioning composition in the form of a first disc-like pelletized layer continuous with said floor and with a lower zonal section of said wall of said container,

said first pelletized layer defining a base layer of said laminate,

a detergent composition in the form of a second disc-like pelletized layer in said container,

said second layer overlying and being in intimate contact with a top surface of said first layer and in fluid-sealing



abutting engagement with a confining circumscribing bounding wall of said container,

said second pelletized layer being subject to and undergoing dissolution upon introduction of said receptacle containing said plug-like laminate into wash water present in a machine during a fabric washing cycle,

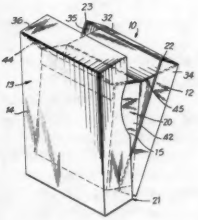
said second pelletized layer constituting means for delaying dissolution contact between the wash water and said first pelletized layer, and ensuring that introduction of said fabric conditioning composition of said first pelletized layer into the wash water is deferred until the detergent composition of said second pelletized layer has acted functionally upon a fabric load in the washing machine.

4,588,081

FOLDING CARTON AND BLANK THEREFOR, FOR CIGARETTES

Reginald W. Newsome, Richmond, and James E. Hall, Mechanicsville, both of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Feb. 22, 1985, Ser. No. 704,484
Int. Cl.[4] B65D *85/10*
U.S. Cl. 206—251 **7 Claims**



1. A folding carton comprising:

a caddy member, said caddy member having a solid rectangular shape, and having a height shorter than the length of a cigarette, a width approximately an integral multiple of the diameter of a cigarette and a depth sufficient to accommodate a plurality of rows of cigarettes, said caddy member further having a front wall and a back wall each defined by said height and said width, first and second side walls defined by said height and said depth, and a bottom wall defined by said width and said depth;

a back cover member having a back wall, a top wall, a

bottom wall, and two side walls, said back cover member nestingly engaging said back, side and bottom walls of said caddy member and having a height substantially the length of a cigarette;

a front cover member having a front wall, a top wall, a bottom wall, and two side walls, said front cover member nestingly engaging said front wall of said caddy member and said top, bottom and side walls of said back cover member;

a hinge connecting said bottom wall of said front cover member to said bottom wall of said back cover member for pivoting said front and back cover members between an open position and a closed position; and

first lifting means connecting said caddy member to said front cover member and second lifting means connecting said caddy member to said back cover member whereby said caddy member is caused to project vertically from between said front and back cover members when said front and back cover members are moved to said open position and to retract between said front and back cover members when said front and back cover members are moved to said closed position, said first lifting means comprising a web hinged at a first end thereof to said caddy member and hinged at a second end thereof remote from said first end to said front cover member and said second lifting means comprising a web hinged at a first end thereof to said caddy member and hinged at a second end thereof remote from said first end to said back cover member;

said caddy member being erected from a first paperboard blank, said front cover member and said first lifting means being erected from a second paperboard blank, and said back cover member and said second lifting means being erected from a third paperboard blank; wherein

said first blank comprises:

a front wall panel defined by a pair of parallel long front-defining score lines and a short front-defining score line perpendicular to said long front-defining score lines;

a first outer side wall panel connected to said front wall panel along one of said long front-defining score lines, and further defined by a first closure tab-defining score line perpendicular to said one of said long front-defining score lines;

a second outer side wall panel connected to said front wall panel along the other of said long front-defining score lines, and further defined by a second closure tab-defining score line perpendicular to said other of said long front-defining secure lines and by a first long rear-defining score line parallel to said long front-defining score lines;

a rear wall panel connected to said second outer side wall panel along said first long rear-defining score line, and further defined by a second long rear-defining score line parallel to said first long rear-defining score line and a short rear-defining score line perpendicular to said long rear-defining score lines;

an inner side wall panel connected to said rear wall panel along said second long rear-defining score line;

an outer bottom wall panel connected to said front wall panel along said short front-defining score line;

an inner bottom wall panel connected to said rear wall panel along said short rear-defining score line;

a first closure tab connected to said first outer side wall panel along said first closure tab-defining score line; and

a second closure tab connected to said second outer side wall panel along said second closure tab-defining score line.

2. A folding carton comprising:

a caddy member, said caddy member having a solid rectangular shape, and having a height shorter than the length of a cigarette, a width approximately an integral multiple of the diameter of a cigarette and a depth sufficient to accommodate a plurality of rows of cigarettes, said caddy member further having a front wall and a back wall each defined by said height and said width, first and second side walls defined by said height and said depth, and a bottom wall defined by said width and said depth;

a back cover member having a back wall, a top wall, a bottom wall, and two side walls, said back cover member nestingly engaging said back, side and bottom walls of said caddy member and having a height substantially the length of a cigarette;

a front cover member having a front wall, a top wall, a bottom wall, and two side walls, said front cover member nestingly engaging said front wall of said caddy member and said top, bottom and side walls of said back cover member;

a hinge connecting said bottom wall of said front cover member to said bottom wall of said back cover member for pivoting said front and back cover members between an open position and a closed position; and

first lifting means connecting said caddy member to said front cover member and second lifting means connecting said caddy member to said back cover member whereby said caddy member is caused to project vertically from between said front and back cover members when said front and back cover members are moved to said open position and to retract between said front and back cover members when said front and back cover members are moved to said closed position, said first lifting means comprising a web hinged at a first end thereof to said caddy member and hinged at a second end thereof remote from said first end to said front cover member and said second lifting means comprising a web hinged at a first end thereof to said caddy member and hinged at a second end thereof remote from said first end to said back cover member;

said caddy member being erected from a first paperboard blank, said front cover member and said first lifting means being erected from a second paperboard blank, and said back cover member and said second lifting means being erected from a third paperboard blank; wherein

said second blank comprises:

a front face panel defined by a pair of parallel long front face-defining score lines and a pair of parallel short front face-defining score lines perpendicular to said long front face-defining score lines;

a first outer side skirt panel connected to said front face panel along one of said long front face-defining score lines, said first outer side skirt panel further defined by a first side skirt-defining score line parallel to said long front face-defining score lines, and having a first partial circular cutout along said first side skirt-defining score line;

a second outer side skirt panel connected to said front face panel along the other of said long front face-defining score lines, said second outer side skirt panel further defined by a second side skirt-defining score line parallel to said long front face-defining score lines, and having a second partial circular cutout along said second side skirt-defining score line;

a first inner side skirt panel connected to said first outer side skirt panel along said first side skirt-defining score line and having a third partial circular cut-out adjacent said first partial circular cutout;

a second inner side skirt panel connected to said second outer side skirt panel along said second side skirt-defining score line and having a fourth partial circular cutout adjacent said second partial circular cutout;

an outer bottom skirt panel connected to said front face panel along one of said short front face-defining score lines, and further defined by a long bottom skirt-defining score line parallel to said short front face-defining score lines and by a pair of parallel short bottom skirt-defining score lines perpendicular to said long bottom skirt-defining score line;

an inner bottom skirt panel connected to said outer bottom

skirt panel along said long bottom skirt-defining score line;

a first bottom skirt closure tab connected to said outer bottom skirt panel along one of said short bottom skirt-defining score lines;

a second bottom skirt closure tab connected to said outer bottom skirt panel along the other of said short bottom skirt-defining score lines;

an outer top skirt panel connected to said front face panel along the other of said short front face-defining score lines, and further defined by a long top skirt-defining score line parallel to said short front face-defining score lines and by a pair of parallel short top skirt-defining score lines perpendicular to said long top skirt-defining score line;

an inner top skirt panel connected to said outer top skirt panel along said long top skirt-defining score line, and further defined by a front perforation line;

a first top skirt closure tab connected to said outer top skirt panel along one of said short top skirt-defining score lines;

a second top skirt closure tab connected to said outer top skirt panel along the other of said short top skirt-defining score lines;

a front lifting web panel connected to said inner top skirt panel along said front perforation line and further defined by a front lifting score line; and

a front lifting tab connected to said front lifting web panel along said front lifting score line.

3. A folding carton comprising:

a caddy member, said caddy member having a solid rectangular shape, and having a height shorter than the length of a cigarette, a width approximately an integral multiple of the diameter of a cigarette and a depth sufficient to accommodate a plurality of rows of cigarettes, said caddy member further having a front wall and a back wall each defined by said height and said width, first and second side walls defined by said height and said depth, and a bottom wall defined by said width and said depth;

a back cover member having a back wall, a top wall, a bottom wall, and two side walls, said back cover member nestingly engaging said back, side and bottom walls of said caddy member and having a height substantially the length of a cigarette;

a front cover member having a front wall, a top wall, a bottom wall, and two side walls, said front cover member nestingly engaging said front wall of said caddy member and said top, bottom and side walls of said back cover member;

a hinge connecting said bottom wall of said front cover member to said bottom wall of said back cover member for pivoting said front and back cover members between an open position and a closed position; and

first lifting means connecting said caddy member to said front cover member and second lifting means connecting said caddy member to said back cover member whereby said caddy member is caused to project vertically from between said front and back cover members when said front and back cover members are moved to said open position and to retract between said front and back cover members when said front and back cover members are moved to said closed position, said first lifting means comprising a web hinged at a first end thereof to said caddy member and hinged at a second end thereof remote from said first end to said front cover member and said second lifting means comprising a web hinged at a first end thereof to said caddy member and hinged at a second end thereof remote from said first end to said back cover member;

said caddy member being erected from a first paperboard blank, said front cover member and said first lifting means being erected from a second paperboard blank, and said back cover member and said second lifting means being erected from a third paperboard blank; wherein

said third blank comprises:

a rear face panel defined by a pair of parallel long rear face-defining score lines and a pair of parallel short rear face-defining score lines perpendicular to said long rear face-defining score lines;

a first outer side rim panel connected to said rear face panel along one of said long rear face-defining score lines, said first outer side rim panel further defined by a first side rim-defining score line parallel to said long rear face-defining score lines;

a second outer side rim panel connected to said rear face panel along one of said long rear face-defining score lines, said second outer side rim panel further defined by a second side rim-defining score line parallel to said long rear face-defining score lines;

a first inner side rim panel connected to said first outer side rim panel along said first side rim-defining score line;

a second inner side rim panel connected to said second outer side rim panel along said second side rim-defining score line;

an outer bottom rim panel connected to said rear face panel along one of said short rear face-defining score lines, and further defined by a long bottom rim-defining score line parallel to said short rear face-defining score lines and by a pair of parallel short bottom rim-defining score lines perpendicular to said long bottom rim-defining score line;

an inner bottom rim panel connected to said outer bottom rim panel along said long bottom rim-defining score line;

a first bottom rim closure tab connected to said outer bottom rim panel along one of said short bottom rim-defining score lines;

a second bottom rim closure tab connected to said outer bottom rim panel along the other of said short bottom rim-defining score lines;

an outer top rim panel connected to said rear face panel along the other of said short rear face-defining score lines, and further defined by a long top rim-defining score line parallel to said short rear face-defining score lines and by a pair of parallel short top rim-defining score lines perpendicular to said long top rim-defining score line;

an inner top rim panel connected to said outer top rim panel along said long top rim-defining score line and further defined by a second perforation line;

a first top rim closure tab connected to said outer top rim panel along one of said short top rim-defining score lines;

a second top rim closure tab connected to said outer top rim panel along the other of said short top rim-defining score lines;

a rear lifting web panel connected to said inner top rim panel along said second perforation line, and further defined by a rear lifting score line; and

a rear lifting tab connected to said rear lifting web panel along said rear lifting score line.

4,588,082

CIRCULAR SAWBLADE PACKAGING CASE

Jody W. Ridings, Shelby, N.C., assignor to Plastic Oddities, Inc., Shelby, N.C.

Filed Mar. 19, 1985, Ser. No. 713,551

Int. Cl.[4] A45C *11/26*

U.S. Cl. 206—349 **1 Claim**

1. A one piece safe and inexpensive circular sawblade packaging and carrying case, comprising in combination,

a one piece plastic sheet comprising substantially the entire carrying case for circular sawblades hinged by living hinges at two places to form two equal length side cover panels extending from a base stand panel forming an isosceles triangle connected therebetween upon which the

case when containing a sawblade will rest with the cover panels extending generally upwardly therefrom and forming a storage compartment for encompassing circular sawblades,

a circular saw mounting post integrally extending inwardly into the storage compartment from one of said cover panel side walls towards the other for engaging the center hole of circular sawblades about the post to hold at least one circular sawblade adjacent to and parallel with said side cover panel,

manually actuatable fastening means at the free ends of each side cover panel defining resiliently deformable mating latch members integrally formed with said side cover panel free ends for holding the two side cover panels together to define a closed protective casing about a circular sawblade held between said covers, and

a carrying handle integrally extending from one of said side cover panels at the free end positioned at the apex of the isosceles triangle formed by said base and equal side cover panels positioned remote from said base.

4,588,083

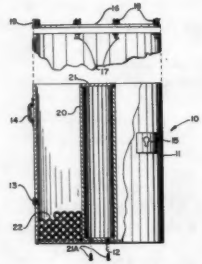
GARDEN HOSE STORAGE CONTAINER

Clifford L. Hunt, 5631 Kensington, El Paso, Tex. 79924, assignor to Clifford L. Hunt, El Paso, Tex.

Filed Jan. 3, 1983, Ser. No. 455,255

Int. Cl.[4] B65D *85/04*

U.S. Cl. 206—389 **1 Claim**



1. A storage container assembly for a garden hose, comprising, in combination, a cylindrical container and a circular cover for closing an upper open end of said container, a cylindrical post in the center of said container for said hose to be coiled therearound, and means to lock and seal said cover upon said container, said means comprising a plurality of spaced-apart hooks around the upper edge of said container, and a like plurality of spaced-apart locking latches around the edge of said cover for engagement together; a convenient carrying handle and a valve plug on a side of said container; and a fitting affixed on said container side for receiving a wall-mounted hook.

4,588,084

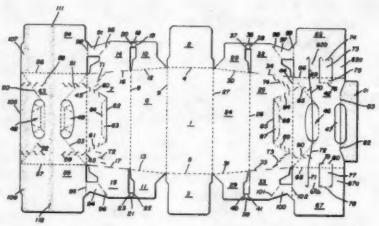
ENCLOSED BOTTLE CARRIER FOR RETURNABLE BOTTLES

John M. Holley, Jr., Austell, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed May 28, 1985, Ser. No. 738,249

Int. Cl.[4] B65D *75/00, 5/46*

U.S. Cl. 206—427 **8 Claims**



1. A bottle carrier comprising a bottom wall, side walls foldably joined to side edges of said bottom wall, a composite top wall formed of inner and outer overlapping panels foldably joined respectively to the upper edges of said side walls, end closure structure at each end of the carrier including end flaps foldably joined to each end edge of said bottom, side and top walls and folded inwardly and secured in position to close the carton ends, the side edge of said outer panel which is remote from the side wall to which said outer panel is foldably joined being secured in face contacting relation to the side edge of said inner panel which is adjacent the side wall to which said inner panel is foldably joined to form a bonded area therebetween, a bond inhibiting substance applied to a face contacting outer surface area of the inner one of said overlapping panels other than said bonded area to facilitate delamination thereof, a handle reinforcing panel foldably joined to the edge of said inner panel which is remote from the side wall to which said inner panel is foldably joined, said handle reinforcing panel being folded into flat face contacting relation with the inner surface of said inner panel to form a three ply handle, and a tear out section defined by a pair of transverse spaced apart tear lines formed in said outer panel and which extend into the top portions of both side walls and which communicate with an access slit formed in at least one of said side walls whereby removal of said tear out section includes removal of the outer ply of said three ply handle and exposes the remaining two plys thereof.

4,588,085

STERILE AIR FEEDTHROUGH PACKAGING SYSTEM FOR TESTING HYDROCEPHALUS SHUNT VALVES

Marvin L. Sussman, Miami, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed Mar. 11, 1985, Ser. No. 710,439

Int. Cl.[4] B65D *81/20*

U.S. Cl. 206—438 **26 Claims**

1. A sealed, sterile packaging system having air communication means for connecting a source of pressurized air located externally of said packaging system to a device positioned in an interior compartment of the packaging system for the air pressure testing of valves of such a device comprising:

an inner package defining a first sterilizable interior compart-

ment and having a peripheral seal which can be broken for opening said inner package;

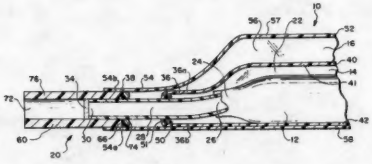
an outer package defining a second sterilizable interior compartment that holds said inner package therein, said outer package having a peripheral seal which can be broken for opening said outer package;

means for sealing the peripheries of said inner and outer packages;

and air communication means comprising a sterile connector assembly positioned within and across a portion of the sealed periphery of the inner and outer packages, for allowing pressurized air to flow therethrough to the interior of the device in the inner package from the external source of pressurized gas without compromising the sterility of the device.

17. A sterile connector assembly that transmits pressurized air or other gaseous substance from an externally located source to a device located within an interior compartment defined within a peripherally sealed packaging system for air pressure testing of valves of the device, said connector assembly comprising:

a cylindrical connector housing having a first end thereof located within the interior of the packaging system, a second end located exterior of the packaging system, and an intermediate portion disposed within a portion of the sealed peripheral region of the packaging system, said connector housing having a lumen extending therethrough;



a filter centrally disposed within and across said lumen of said sterile connector housing in such a manner as to allow molecules of pressurized air or other pressurized gaseous material to pass therethrough while sealing or plugging said connector housing against entry of particles which are larger than molecules of gas, such as bacterial contaminants;

sealing means for sealing said connector housing within the sealed peripheral portion of the packaging system, said sealing means being capable of maintaining said seal during periods when stress is placed on said connector housing to ensure integrity of the seal; and

connecting means associated with said connector housing for connecting said first interior end of said connector housing with the interior of the device positioned within the sealed packaging system to provide a passageway through which pressurized air entering the connector assembly can be shunted into the interior of the device for air pressure testing of the valves of the device; said connecting means comprising a cannula or tube extending from said first or interior end of said connector housing to and into one end of the device packaged within the packaging system.

4,588,086

SUBSTRATE AND MEDIA CARRIER

Thomas U. Coe, 15217 Sobey Rd., Saratoga, Calif. 95070

Filed Jun. 7, 1984, Ser. No. 618,189

Int. Cl.[4] B65D *85/57*

U.S. Cl. 206—444 **22 Claims**

1. A carrier for substrate and media disk members comprising:

a base member having

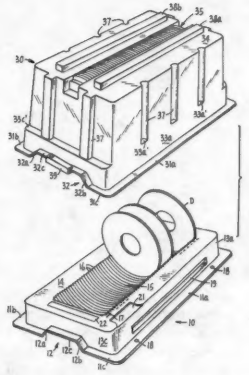
a flat peripheral base flange,

upstanding side and end walls connected to said base flange,

a top surface having

a semicylindrical disk supporting recess projecting downwardly toward said peripheral base flange and including a Plurality of continuous semicircular V-shaped grooves each subtending an arc of less than 180 degrees for holding a disk member, and

locating means in said base peripheral flange along only one side wall for locating said carrier in disk handling equipment.



4,588,087

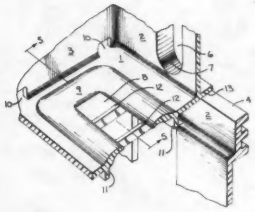
FRUIT CONTAINER

Harold E. Swingley, Jr., Monona, Wis., assignor to Menasha Corporation, Neenah, Wis.

Filed Jan. 3, 1984, Ser. No. 567,739

Int. Cl.[4] B65D *21/02, 1/22*

U.S. Cl. 206—509 **6 Claims**



1. In a container for fruit or the like that is made of substantially impervious material and includes a horizontal bottom wall completely circumscribed by vertical side and end walls, the improvement wherein:

at least one elongated ventilation opening is formed through the bottom wall and is completely surrounded by a raised rib which extends above the level of the bottom wall;

there are a plurality of reinforcing ribs on the lower surface of the bottom wall that span the ventilation opening;

at least one weep hole is formed through a vertical wall, each said weep hole extending at least partially below the level of the raised rib; and

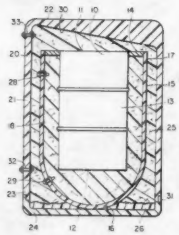
the upper surface of the bottom wall outside of the raised rib is flat to define a channel so that fluid collected thereon will flow out through the weep holes rather than through the ventilation openings.

4,588,088

CONTAINER ASSEMBLY FOR STORING TOXIC MATERIAL

Arthur A. Allen, 601 State Rd. 28 East, Williamsport, Ind. 47993

Filed Jan. 10, 1983, Ser. No. 457,056
Int. Cl.[4] B65D *25/14, 90/08;* G21F *5/00*
U.S. Cl. 206—525 **6 Claims**



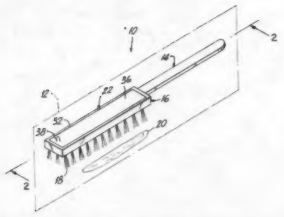
1. A sealed container of toxic waste comprising:
an original container of toxic waste;
an inside container holding said original container;
a solidified sealant insulating said original container from said inside container;
an outside container holding said inside container;
a solidified mass insulating said outside container from said inside container;
said solidified mass is denser than said solidified sealant;
said outside container includes an upwardly extending side wall and a top wall extending thereacross, said top has an interior surface slanting upwardly from said side wall, said container further includes a relief valve positioned adjacent the uppermost portion of said surface.

4,588,089

DISPOSABLE TOOTH BRUSH

Rudolph A. Yanz, Jr., and George Spector, both of 233 Broadway RM 3615, New York, N.Y. 10007

Filed Sep. 17, 1984, Ser. No. 651,523
Int. Cl.[4] B65D *83/00;* A46B *11/00*
U.S. Cl. 206—581 **5 Claims**



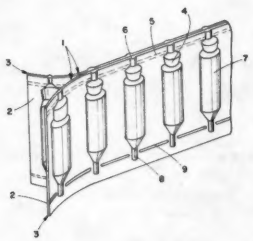
1. A disposable dental package which comprises:
(a) a sanitary wrapper;
(b) a toothbrush having a head with a plurality of rows of bristles, said toothbrush sealed in said sanitary wrapper;
(c) a small packet of toothpaste sealed in said sanitary wrapper; and
(d) means for dispensing said toothpaste from said packet into said bristles of said toothbrush after said toothbrush and said packet are removed from said sanitary wrapper, wherein said means for dispensing said toothpaste from said packet into said bristles of said toothbrush comprises:
(a) said head having a first horizontal elongated hollow chamber and a second horizontal elongated hollow chamber separated by a perforated middle wall therebetween having a plurality of spikes extending into said first horizontal elongated hollow chamber, said first horizontal elongated hollow chamber having an open back and said second horizontal elongated hollow chamber having a perforated front wall;
(b) a removeable lid having a finger grip tab, said lid is placed into said open back of said first horizontal elongated hollow chamber after said toothpaste packet is placed therein so that when said lid is manually depressed into said first horizontal elongated hollow chamber said spikes will puncture said packet allowing said toothpaste to enter said second elongated hollow chamber via said perforated middle wall and out through said perforated front wall into said bristles.

4,588,090

BLISTER PACK STRIP

Gisbert Spuck, Rosbach, and Gerhard Ludwig, Weiler, both of Fed. Rep. of Germany, assignors to Cito-Pac Verpackungsgesellschaft mbH, Rosbach, Fed. Rep. of Germany

Continuation of Ser. No. 395,287, Jul. 6, 1982, abandoned. This application Feb. 13, 1984, Ser. No. 578,608
Claims priority, application Fed. Rep. of Germany, Jul. 7, 1981, 3126671
Int. Cl.[4] B65D *17/28;* B65B *47/100*
U.S. Cl. 206—532 **11 Claims**



1. A blister pack strip, which is adapted to receive a medicine, and having two congruent cupped plastic foils, which are welded together in mirror image, and form elongated pockets each provided with a filling funnel, characterized in that the elastic form-stable filling funnel is closed over its edge by a welding seam running parallel to the edge of the foils, the foils each consisting on the outside of a polystyrene layer, approximately 140 microns thick, and on the inside a polyethylene layer 40 to 50 microns thick, said two inside layers being joined to each other and further comprising:
a plurality of welded-up squirt nozzles, one communicating with each pocket, said squirt nozzles being provided along an edge of said strip opposite to said filling funnels; and
a groove provided transversely to said squirt nozzles and parallel with an adjacent edge of the strip.

4. A blister pack strip comprising:
two congruent deep drawn carrier foils of polystyrene, each foil having a thickness of up to 190 microns;
a coating of polyethylene having a thickness of up to 50 microns on facing surfaces of said two congruent carrier foils, wherein said two carrier foils are welded together in mirror image to form a band-like strip with a plurality of pockets therein;
a plurality of inlet funnels positioned along one edge of the strip, each funnel communicating with a respective pocket;
a weld bridge provided across at least a portion of each of said inlet funnels;
to form a respective pressure equalizing opening in an area of said funnel not closed by said weld bridge; and,
a plurality of squirt nozzles, one communicating with each

pocket, said squirt nozzles being positioned on the side of the strip opposite to the inlet funnels.

10. A method of manufacturing a blister pack strip provided with contents, comprising:

heating a pair of carrier foils up to welding temperature;

deep drawing each of said carrier foils to create a plurality of pocket halves and adjacent inlets and opposed, adjacent squirt nozzles;

pressing said pair of carrier foils together to create a blister pack strip, said squirt nozzles being closed during said step of processing and said inlets being left open to provide communication with the pockets;

at a later time pressing a substantially uninterrupted weld bridge into the blister pack strip adjacent to an edge of said strip and across at least a portion of each said inlet nearest to said edges;

subsequently filling said blister pack strip with sterile contents; and

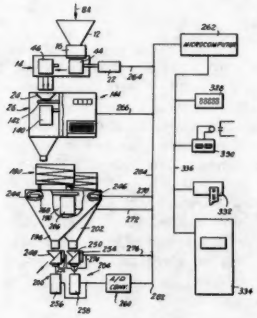
sealing said openings.

4,588,091

METHOD AND APPARATUS TO DETERMINE QUALITY OF PARTICULATE MATERIAL

Franklin J. Wade, Omaha, Nebr., assignor to Intersystems, Inc., Omaha, Nebr.

Filed May 27, 1983, Ser. No. 498,915
Int. Cl.[4] B07C 5/00
U.S. Cl. 209—546 **24 Claims**



1. An apparatus for the measurement of quality parameters of granular material comprising

support means,

loader means, mounted on said support means and capable of receiving said granular material and preparing a volume sample of said granular material,

metering means, mounted on said support means and capable of receiving said volume sample and measuring the moisture content of said sample,

screen means mounted on said support means and capable of receiving said sample from said metering means and separating said sample into fractions according to kernel size,

scale means mounted on said support means and capable of receiving said fractions of granular material and individually weighing said fractions,

computer means mounted on said support means, and

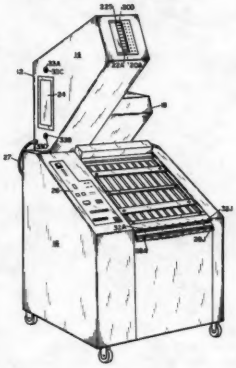
electrical connection means connecting said loader means, said metering means, said screen means, said scale means and said computer means for control of the sequence of operation of said loader, metering, screen, scale and computer means and for calculation of moisture content, density and percentage of foreign material contained in said sample.

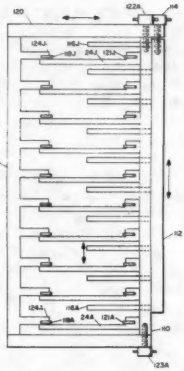
4,588,092

INTEGRATED CIRCUIT HANDLING AND CONTACT SYSTEM

Carl Moechnig, and Frank C. Lunquist, both of St. Paul, Minn., assignors to Automated Electronic Technology, Inc., N. St. Paul, Minn.

Filed Nov. 15, 1983, Ser. No. 551,905
Int. Cl.[4] B07C 5/344
U.S. Cl. 209—573 **10 Claims**





1. Integrated circuit (IC) handling and contact system comprising:

(a) a plurality of individual readily adjustable vertically stacked input tracks including means for accepting different width and thickness of an IC package, and means for pivoting said stacked vertical input tracks about a common pivot point;

(b) singulator means including moving oscillating means for passing an integrated circuit one at a time on a track from one of said vertically stacked input tracks;

(c) contactor assembly means including gripper means for engaging an integrated circuit into said contactor assembly from said singulator means;

(d) transfer means for transferring an integrated circuit from said gripper means about a radial pivot;

(e) sorter means including a monodirectional sorter belt and a plurality of carriers secured thereto for transporting and sorting an integrated circuit from said transfer means; and,

(f) a plurality of individual readily adjustable output tracks for holding each tested integrated circuit including means

for accepting different width and thickness of IC packages from said sorter means.

4,588,093

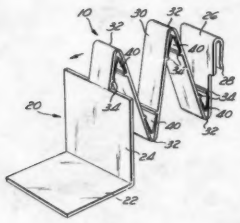
MERCHANDISE DISPLAY DEVICE

Frank P. Field, 122 Eucalyptus Dr., El Segundo, Calif. 90245

Continuation of Ser. No. 451,004, Dec. 20, 1982. This application Feb. 4, 1985, Ser. No. 697,701

Int. Cl.[4] A47F 5/00

U.S. Cl. 211—51 **3 Claims**



1. A device for maintaining merchandise in a stacked orientation within a display case comprising:

a base member formed to contact one end of a stack of merchandise disposed within a display case;

an anchor member adapted to be attached to said display case, wherein said anchor member comprises a bent over V-shaped clip adapted to be attached to one wall of said display case;

an extensible member integrally formed with said base member and said anchor member to extend between said base member and said anchor member, said extensible member having a plurality of interconnected elongate segments disposed in a bellow-like relative orientation to define a plurality of apexes at opposite ends of each elongate segment;

a plurality of V-shaped springs mounted to said extensible member, at each said apex, for biasing said extensible member to tend to elongate said extensible member and urge said base member away from said anchor member in a continuously expansive manner to continuously compress said stack of merchandise within said display case as individual merchandise is periodically removed from said stack of merchandise; and

a pair of stops formed adjacent each of said apexes for mounting said V-shaped spring to said extensible member.

4,588,094

WALL-MOUNTED FILE TRAY

Dale M. Evans, Windsor, Wis., assignor to Don Evans, Inc., DeForest, Wis.

Filed Sep. 28, 1984, Ser. No. 656,027

Int. Cl.[4] A47F 7/00

U.S. Cl. 211—55 **14 Claims**

1. A file tray adapted to be mounted on a generally vertical wall with headed fasteners that are driven into the wall and have heads and shanks, the file tray being adapted to serve both as a primary and a secondary file tray in a vertical array including a primary file tray and at least one secondary file tray, the file tray comprising:

a vertically oriented mounting surface adapted to rest against the wall on which the file tray is mounted; and

a compartment attached to the mounting surface and including a back wall extending upwardly from a selected location on the mounting surface for a selected portion of the vertical height thereof and a floor extending from the back wall forwardly;

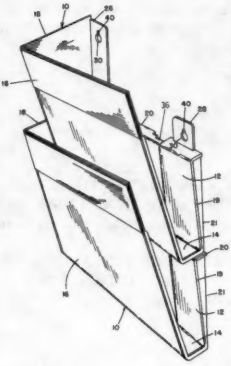
the mounting surface including:

(a) at least one bottom mounting tab extending downwardly beneath the back wall, the bottom mounting tab having an aperture therethrough to receive and engage the shank of a headed fastener and being adapted to be retained behind the head of the fastener; and

(b) at least one top mounting tab extending upwardly above the back wall, the top mounting tab having an aperture therethrough to receive and engage the shank of a headed fastener and being adapted to be retained behind the head of the fastener;

the back wall including a channel vertically aligned with the top mounting tab and having a depth sufficient to admit a top mounting tab when inserted from beneath, the channel extending upwardly from the downwardmost margin of the back wall and forwardly from the mounting surface, the back wall also having a rearwardly opening notch to so accommodate the bottom mounting tabs of a file tray when said bottom mounting tabs are moved into place from above as to provide unrestricted access for such bottom mounting tabs to the wall on which the file tray is to be mounted;

whereby a first file tray may be attached to the wall as a primary file tray by headed fasteners engaged by the bottom and top mounting tabs and additional file trays may be added as secondary file trays both above and below the primary file tray, all without the need to remove the primary file tray from the wall.



4,588,095

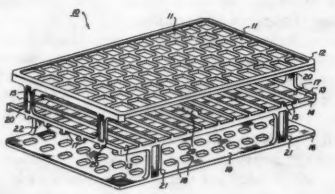
SINGLE-PIECE INJECTION MOLDED RACK

Ravinder C. Mehra, Fairport, N.Y., assignor to Sybron Corporation, Rochester, N.Y.

Filed Nov. 10, 1983, Ser. No. 550,574

Int. Cl.[4] A47B 73/00

U.S. Cl. 211—74 **36 Claims**



1. A single-piece injection molded rack comprising:

a plurality of spaced-apart superposed tiers including a top tier, a bottom tier, and an intermediate tier, said intermediate tier being disposed between said top and bottom tiers,

said top tier including apertures, said intermediate tier having a top set of bars and a bottom set of bars, selected bars within said top set being superposed over and intersecting with selected bars within said bottom set to define apertures, selected apertures in said intermediate tier being operatively aligned with selected apertures in said top tier;

first support means for interconnecting said top tier and said intermediate tier; and

second support means for interconnecting said intermediate tier and said bottom tier.

4,588,096

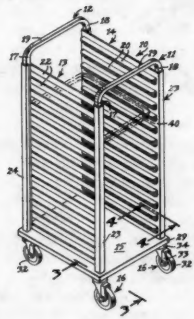
KNOCK-DOWN TRAY RACK

Ray A. Story, Nashville, and Granville P. Elrod, Murfreesboro, both of Tenn., assignors to Standex International Corporation, Salem, N.H.

Filed Sep. 9, 1985, Ser. No. 773,873

Int. Cl.[4] A47F *7/00*

U.S. Cl. 211—126 **9 Claims**



1. A tray rack comprising:

(a) a base member having at least one pair of socket members therein,

(b) first and second side panels, each side panel having at least one elongated upright sleeve member,

(c) at least one bow-shaped support member including a pair of elongated parallel upright members having upper end portions, a transverse bridge member integrally connecting said upper end portions, and free lower end portions,

(d) each of said upright members being adapted to be telescopingly received in a corresponding sleeve member so that said bridge member is above said side panels in an upright assembled position,

(e) said upright members being longer than said corresponding sleeve members,

(f) said free lower end portions being securely received in said corresponding socket members to rigidly support said support member and said side panels on said base member, in said assembled position, and

(g) support means on said side panels for supporting vertically spaced trays above said base member and between said side panels.

4,588,097

SAFETY CLOSURE CAP FOR CONTAINERS

Ivo J. Hauser, 5 Winding La., Westport, Conn. 06880

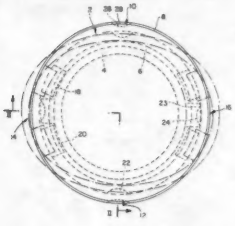
Filed Apr. 2, 1985, Ser. No. 718,874

Claims priority, application Switzerland, Apr. 3, 1984, 1682/84

Int. Cl.[4] B65D *55/02*

U.S. Cl. 215—216 **10 Claims**

1. Container closure cap having closure segments for a container having a neck encircled with an endless closure bead which can be opened by hand, comprising a top panel, a cap skirt having at least two pressure points and at least one expansion area for deforming the cap by exerting a pressure on the pressure points, said expansion area being located intermediate



the pressure points, and having a closure segment engaging the closure bead whereby pressure exerted on the cap skirt at the pressure points causes a deflection of the expansion area and a simultaneous disengagement of at least one closure segment located in the expansion area.

4,588,098

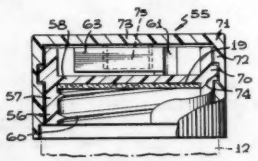
CLOSURES FOR CONTAINERS HAVING TAMPERING INDICATING MEANS

Zoltan Uzdy, 14206 Summertime La., Culver City, Calif. 90230

Filed Jan. 31, 1985, Ser. No. 696,999

Int. Cl.[4] B65D *55/02*

U.S. Cl. 215—230 **7 Claims**



1. A closure assembly for a container comprising:

a closure cap having a first position relative to the container signifying an initially unopened position and a second position relative to the container signifying an opened or pre-tampered position;

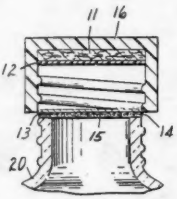
angular displacement indicating marker means cooperatively carried on said closure cap and said container designating said closure cap in either one of said first or second positions; and

said marker means includes reference indicia displayed on said container and on said closure cap whereby angular displacement separates said respective indicia in spaced-apart relationship.

4,588,099
FILM SEAL FOR CONTAINER

Donald E. Diez, Birchwood Village, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 25, 1985, Ser. No. 727,149
Int. Cl.[4] B65D *53/04*
U.S. Cl. 215—232 18 Claims

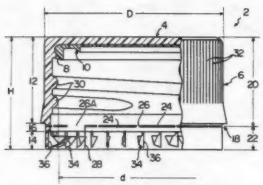


5. A container innerseal comprising a pulpboard backing, a layer of wax coated over said backing, metallic foil overlying said wax layer, and a biaxially oriented polymeric film adhered to said metallic foil by means of an adhesive layer.

4,588,100
PILFER-PROOF PLASTIC CLOSURE FOR CONTAINERS

Junichi Itsubo; Takashi Yazaki, both of Hiratsuka, and Fumio Mori, Yokohama, all of Japan, assignors to Japan Crown Cork Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 581,845, Feb. 21, 1984, Pat. No. 4,520,939. This application Jan. 2, 1985, Ser. No. 688,391
Claims priority, application Japan, Oct. 26, 1984, 59-224126
Int. Cl.[4] B65D *41/34*
U.S. Cl. 215—252 15 Claims

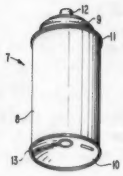


1. A pilfer-proof plastic closure for a container equipped with a mouth-neck portion having an external thread formed on its peripheral surface and a holding jaw portion located below the external thread, said closure comprising a top panel wall and a cylindrical skirt wall extending downwardly from the peripheral edge of the top panel wall, said skirt wall having formed therein a circumferentially extending breakable line dividing the skirt wall ihto a main portion above the breakable line and a pilfer-proof bottom portion below it, said main portion having formed on its inner surface an internal thread to be engaged with the external thread on the mouth-neck portion of the container and said pilfer-proof bottom portion having formed on its inner surface a plurality of radially inwardly projecting engaging flaps at circumferentially spaced positions; each of said engaging flaps having a first portion extending from the inner surface of the pilfer-proof bottom portion and a second portion extending further from the forward end of the first portion inclinedly to the first portion in the closing direction of the closure for mounting the closure on the mouth-neck portion.

4,588,101
SAFETY VENT FOR CONTAINERS

Josef N. Ruegg, Tallapoosa, Ga., assignor to Southern Can Company, Tallapoosa, Ga.

Filed Oct. 10, 1984, Ser. No. 659,544
Int. Cl.[4] B65D *51/16, 83/14;* F16K *17/14*
U.S. Cl. 220—89 A 20 Claims

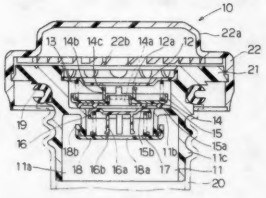


1. A safety vent for an internally pressurized fluid container comprising a generally inwardly concave end wall of said container, said end wall having a structural integrity which reacts to an increase in fluid pressure in said container above a predetemined level by initially undergoing at least a partial outward deformation at a location along the outer peripheral area thereof, the outward deformation commencing in said outer peripheral area and progressing inwardly, a weakened line of reduced material thickness formed in said end wall in a location spaced inwardly of said outer peripheral area of said end wall, said weakened line of reduced material thickness being adapted to fracture to vent the pressurized fluid from said container in response to the stresses thereon during said outward deformation of said wall, and means for controlling the location along the outer peripheral area of said end wall at which said deformation starts when the internal pressure of said container exceeds said predetermined level, said means for controlling being located in said end wall between said weakened line of reduced material thickness and said outer peripheral area such that said means for controlling is intersected by a radius line of said end wall which passes through said weakened line of reduced material thickness.

4,588,102
CAP WITH VALVE

Joji Kasugai, Ichinomiya, Japan, assignor to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed May 30, 1985, Ser. No. 739,099
Claims priority, application Japan, May 30, 1984, 59-79962[U]
Int. Cl.[4] B65D *51/16*
U.S. Cl. 220—203 3 Claims



1. A cap with valve comprising:
(a) a cap body having a fluid flow path and a stepped portion provided on inner circumference of the fluid flow path;
(b) a first spring shoe plate having a locking hole and engaged with opposite side to said stepped portion at one end of said cap body fluid flow path;
(c) a first spring arranged on said first spring shoe plate;
(d) an annular seal member with outer circumferential por-

tion abutting on the stepped portion of the cap body fluid flow path;

(e) a support plate having a fluid flowing hole and a plurality of locking legs to be engaged with the locking hole of said first spring shoe plate by deformation with spring action, said support plate fixing said seal member and being disposed in the cap body fluid flow path and making the outer circumferential portion of the seal member abut on the stepped portion by means of biasing force of the first spring arranged on the first spring shoe plate;

(f) a second spring shoe plate having a locking hole and engaged with end of the stepped portion at other end of the cap body fluid flow path;

(g) a second spring arranged on said second spring shoe plate; and

(h) a valve plate having a plurality of locking legs to be engaged with the locking hole of said second spring shoe plate by deformation with spring action, said valve plate being disposed in the cap body fluid flow path and closing the inner circumferential portion of the seal member by means of biasing force of the second spring arranged on the second spring shoe plate,

Whereby at the assembling work, group of the first spring shoe plate, the first spring and the support plate fixing the seal member and group of the second spring shoe plate, the second spring and the valve plate are previously assembled through the locking holes and the locking legs respectively and engaged through the spring shoe plates to inside of the cap body fluid flow path, and then the engaging state of the locking legs with the locking holes is, released and the support plate and the valve plate are arranged.

4,588,103

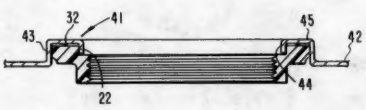
CLOSURE CONSTRUCTION HAVING BACK-UP SUPPORT MEANS

Gary M. Baughman, Auburn, Ind., assignor to Rieke Corporation, Auburn, Ind.

Filed Sep. 18, 1985, Ser. No. 777,407

Int. Cl.[4] B65D *41/04*

U.S. Cl. 220—288 **11 Claims**



1. In combination:

a drum-like container end having a raised boss formed therein, said raised boss including an outer axially extending wall portion, an inner axially extending wall portion and a radially extending connecting wall portion joining said inner and outer wall portions together; and

a synthetic material closure received by said container raised boss and having plug-engaging means internally disposed therein and an annular crimping flange including a first flange surface contiguous with said outer wall portion and a second flange surface contiguous with said inner wall portion.

4,588,104

FLOOR PAN PLUG

Henry F. Danico, Stoneham, Mass., assignor to TRW, Inc., Cleveland, Ohio

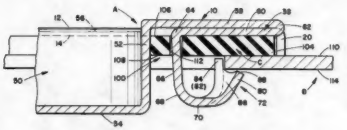
Filed Jul. 12, 1985, Ser. No. 754,484

Int. Cl.[4] B65D *45/16*

U.S. Cl. 220—326 **15 Claims**

1. A closure assembly for closing an aperture in a panel comprising:

a thin plate having opposed first and second surfaces and an outer periphery; a plurality of legs depending from said second surface, each leg having one portion extending generally normally outward from said plate second surface at a location spaced inwardly from said plate outer periphery, and locking means associated with each leg adapted to retain said plate positioned on one side of a panel in covering relation with a predetermined aperture



having an area which is smaller than the area of said plate; and, a central region depending outwardly from said plate second surface a distance which is at least as great as a furthest extension of said plurality of legs from said second surface, whereby said central region defines a protective guard for said plate.

4,588,105

SEALING PLUG

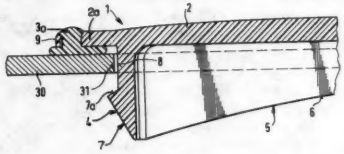
Gunther Schmitz, Enkenbach-Alsenborn; Bodo Greulich, Kaiserslautern, and Gerhard Kettenring, Schopp, all of Fed. Rep. of Germany, assignors to TRW United-Carr GmbH, Frankfurt, Fed. Rep. of Germany

Filed Jul. 22, 1985, Ser. No. 757,563

Claims priority, application Fed. Rep. of Germany, Jul. 26, 1984, 3427626

Int. Cl.[4] B65D *41/00*

U.S. Cl. 220—359 **12 Claims**



1. In a sealing plug device adapted to seal an opening in a panel said plug comprising a head portion having a circumferential dimension larger than the circumference of the opening forming a flange that overlies the edge of said openings,

an array of resilient guide means extending axially from said head portion and disposed in circumferentially spaced apart relation from one another and adapted to be fittingly engaged in said opening, the free end of said guide means equipped with shoulder portions for engaging one of the surfaces of said panel preventing removal of the sealing plug,

a heat responsive plastic ring fittingly disposed on said head portion, the improvement comprising said flange portion formed with shaped receiving openings and said heat responsive plastic ring equipped with lug means adapted to be fittingly received into said receiving openings whereby the heat responsive ring is secured to said sealing plug.

4,588,106

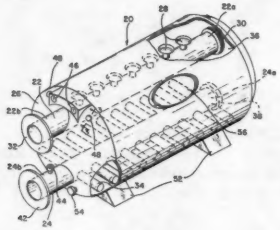
FIBERGLASS MOLDED PRESSURE VESSEL AND METHOD OF MAKING SAME

Robert G. Stark, Sr., 735 NE. 198th St., Seattle, Wash. 98155; Robert G. Stark, Jr., 11643 100th Ave. Northeast, #3A, Kirkland, Wash. 98033; Janet S. Ellis, 1225 Coronado Pl., Edmonds, Wash. 98020, and Tom Stark, 551 Lakeside Dr., Sedro Wooley, Wash. 98284

Filed Dec. 5, 1983, Ser. No. 558,345

Int. Cl.[4] B65D *90/02*

U.S. Cl. 220—414 **13 Claims**



9. A fiberglass pressure vessel of the type that expands when pressurized comprising:

two separately formed vessel halves each having exposed edges which are joined to form a compartment along a juncture,

one of said vessel halves further having a service port of a size sufficient to allow an individual to fully enter said vessel for working therein,

said compartment sealed at said juncture by a bonding layer surrounding both sides of said juncture inside and outside of said compartment,

said compartment wrapped circumferentially with tensioned fibrglass filament in one direction substantially transverse to said juncture and in another direction substantially parallel to said juncture,

said vessel provided with at least one tubular conduit of a material dissimilar to fiberglass and attached in a pressure tight connection to the vessel, said conduit having an outer and an inner end communicating with the interior of said compartment, said conduit having an irregular outer surface adjacent the exterior of said compartment, a second layer of fiberglass filament seated in said irregular surface for providing a mechanical interlocking engagement between the conduit and the fiberglass filaments, a separate fiberglass layer overlaying said fiberglass filament and joined to said compartment, said layer of tensioned fiberglass filament wrapped substantially parallel to said juncture being wrapped around said separate fiberglass layer and said second layer of fiberglass filament to integrally bond the tubular conduit to the compartment, and

said compartment provided with a saddle for slidably receiving said inner end of said tubular conduit, said tubular conduit extending through said vessel half and being sealed and rigidly held thereto, wherein expansion of the compartment upon pressurization will allow said conduit to move independently relative to said saddle.

4,588,107

SORTING APPARATUS

William R. Brennan, 2140 Gunn Rd., Carmichael, Calif. 95608

Filed Jun. 7, 1983, Ser. No. 501,937

Int. Cl.[4] B65G *57/11, 59/06*

U.S. Cl. 221—112 **8 Claims**

1. An apparatus for dispensing at least two different ball bearings in a desired order which comprises:

(a) an indexing plate rotatable through 360 degrees of rotation about a center of rotation, having at least one first hole adapted for receiving a first one of said bearings therein, said first hole being positioned at a first radial distance from said center, and at least one second hole adapted for receiving a second one of said bearings therein, said second hole being positioned at a second radial distance from said center;

(b) inlet means for introducing said objects in each of said holes;

(c) retainer means for retaining said objects in said holes;

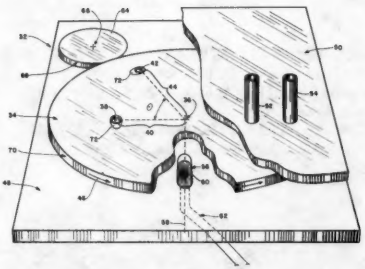
(d) outlet means in communication with said holes for sequentially delivering said objects from said holes in said indexing plate;

(e) storage and transfer means for storing and providing said objects to said inlet means;

(f) conveying and maintaining means for conveying said objects from said outlet means and for maintaining said objects in sequential order; and

(g) means for rotating said indexing plate through 360 degrees of rotation;

wherein the centers of each of said first and second hole pairs are located along a common radius line and wherein the outlet means in communication with said first and second holes is offset from a radius line by an angle of at least $\tan^{-1}d/2cc$, where d is the average diameter of the first and second holes and cc is the distance from said center of rotation to the center of the outermost hole, whereby the bearing carried in a first hole is delivered therefrom into said outlet means at a time different from



the time at which the bearing carried in a second hole is delivered therefrom into said outlet means.

4. An apparatus for dispensing at least two different ball bearings in a desired order which comprises:

(a) an indexing plate rotatable through 360 degrees of rotation about a center of rotation, having at least one first hole adapted for receiving a first one of said bearings therein, said first hole being positioned at a first radial distance from said center, and at least one second hole adapted for receiving a second one of said bearings therein, said second hole being positioned at a second radial distance from said center;

(b) inlet means for introducing said objects in each of said holes;

(c) retainer means for retaining said objects in said holes;

(d) outlet means in communication with said holes for sequentially delivering said objects from said holes in said indexing plate;

(e) storage and transfer means for storing and providing said objects to said inlet means;

(f) conveying and maintaining means for conveying said objects from said outlet means and for maintaining said objects in sequential order; and

(g) means for rotating said indexing plate through 360 degrees of rotation;

wherein the centers of each of said first and second hole pairs are located along different radius lines with said first

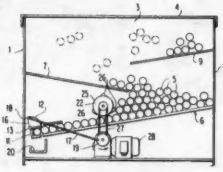
hole leading said second hole in the direction of rotation of said indexing plate by an angle of at least $\tan^{-1}d/2cc$, where d is the average diameter of said holes and cc is the distance from said center of rotation to the outermost hole, and wherein the outlet means in communication with said holes is located along a common radius line, whereby the bearing carried in a first hole is delivered therefrom into said outlet means at a time different from the time at which the bearing carried in a second hole is delivered therefrom into said outlet means.

4,588,108

APPARATUS FOR DISPENSING SPHERICAL OBJECTS

Jordan Knez, and Lars Gartnell, both of Halmstad, Sweden, assignors to Maskinverkstaden Jordan Knez, Halmstad, Sweden

Filed Jul. 29, 1983, Ser. No. 518,573
Claims priority, application Sweden, Nov. 11, 1982, 8206402
Int. Cl.[4] G01F *9/00*
U.S. Cl. 221—68 **3 Claims**



1. An apparatus for discharging a number of golf balls **(5)** comprising a magazine for said golf balls **(5)** said magazine having a floor **(6)** being inclined in relation to a horizontal plane and including a number of parallel rods **(10)** extending in the direction of the inclination, the distance between said rods **(10)** being less than the diameter of said golf balls **(5)** for providing therebetween a path for a number of mutually subsequently located golf balls, a portion of said magazine floor being pivotal for separating the golf balls located thereon from the remaining golf balls on said magazine floor **(6)**, wherein said pivotal portion further comprises parts of said rods **(10)** in said magazine floor **(6)**, forming a continuation of the floor rods and being fixedly retained in an L-shaped bar **(11)** having a shank which forms a wall and having another shank which forms a roof and wherein said L-shaped bar **(11)** with said rod portions is pivotal about its longitudinal axis **(13)** which extends in the position of interconnection between said shanks.

4,588,109

ADHESIVE SUPPLYING SYSTEM

Ewen R. Cameron, Oadby; Robert Yardley, Thurmaston, and Frank H. Wolloff, Birstall, all of England, assignors to USM Corporation, Farmington, Conn.

Filed Feb. 25, 1985, Ser. No. 705,086
Claims priority, application United Kingdom, Feb. 25, 1984, 8404965
Int. Cl.[4] B67D *5/00*
U.S. Cl. 222—63 **9 Claims**

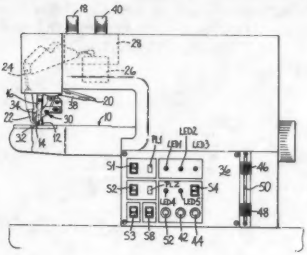
1. Adhesive supply system for hot melt adhesive, comprising a pump,

a melt chamber in which adhesive is rendered molten,

a nozzle through which molten adhesive is supplied from the melt chamber by means of the pump, and

heating means for maintaining the nozzle at an appropriate temperature for ensuring that the adhesive in the nozzle remains molten not only during an adhesive-applying operation but also between successive such operations,

means at the end of an adhesive-applying operation, for sucking back the molten adhesive in the nozzle so as to avoid drooling of adhesive from the nozzle, said sucking means including control means for initiating a primary suck-back operation and for thereafter allowing further auxiliary adhesive suck-back steps to take place through



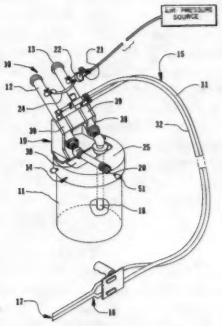
controlled distances which are spaced apart by preselected intervals starting at the end of the primary adhesive suck-back operation.

4,588,110

PORTABLE WATERPROOFING APPARATUS

Dale K. Nelson, Minneapolis, and Allen D. Mathison, Richfield, both of Minn., assignors to Cherne Industries, Inc., Minneapolis, Minn.

Filed Feb. 8, 1985, Ser. No. 699,595
Int. Cl.[4] B67D *5/52*
U.S. Cl. 222—135 **20 Claims**



1. A portable, light-weight waterproofing apparatus for use with a container of a viscous sealant having a top portion of a predetermined diameter and a sealable inlet portion, said portable waterproofing apparatus comprising:

(a) a base cover portion having a downwardly extending circumferential lip having fastening means to secure the apparatus to the top portion of the sealant container,

(b) a frame bracket structure attached to said base cover,

(c) a first pneumatic pump mounted to said frame structure for pumping a less viscous catalyst fluid,

(d) a pickup conduit for extending into the sealant container,

(e) a second pneumatic pump mounted to said frame structure and being in communication with said pickup conduit for pumping the viscous sealant fluid,

(f) an air pressure source connecting means with air pressure regulator and air pressure gauge to simultaneously regulate and operate said pumps,

(g) a delivery hose assembly in communication with said pumps, and

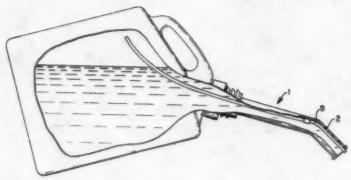
(h) a probe assembly having a handle portion and mixing head assembly for reacting the sealant and catalyst for subsequent transfer to a remote leak location.

4,588,111

VENTED POURING SPOUT

Kjeld Hestehave, 1584 Albright Ave., Upland, Calif. 91786

Continuation-in-part of Ser. No. 92,030, Nov. 7, 1979, abandoned. This application Apr. 30, 1981, Ser. No. 259,165
Int. Cl.[4] B67D *3/00*
U.S. Cl. 222—479 3 Claims



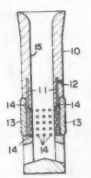
1. In a retractable pouring spout, for use on a container, of the type having a tubular spout member with a pouring passage extending from an inlet end of the spout to an outlet end thereof, an attaching cap within which said spout member is slideably received for axial reciprocation between a pouring position projecting outwardly from the top of said cap and a retracted position projecting outwardly from the bottom of said cap, and a venting passage extending within said pouring passage, the improvement wherein said venting passage is formed in a separate venting tube of resiliently flexible material having a generally S-shaped longitudinal configuration that is substantially longer than the length of said spout member, wherein said spout member has an obtuse angle bend at a location approximately one-third the distance from its outlet end toward its inlet end, said venting tube being resiliently clamped to the spout member solely at a location within said pouring passage adjacent an inlet end side of said bend, wherein said venting tube extends outwardly from the inlet end of the spout member in an unsecured manner and is longitudinally and displaceably shiftable, while remaining clamped to said spout member, upon application of sufficient force to overcome the pressure by which it is resiliently clamped for enabling said venting tube to be positionally adjusted for proper venting in accordance with the specific needs of various different containers and pouring angles.

4,588,112

NOZZLE FOR CONTINUOUS CASTING

Masanao Kondo, Gifu, Japan, assignor to Akechi Ceramics Kabushiki Kaisha, Ena, Japan

Filed Feb. 6, 1984, Ser. No. 577,382
Int. Cl.[4] B22D *3/00*
U.S. Cl. 222—603 2 Claims



1. A nozzle for continuous casting of molten material, comprising:

a nozzle body having walls defining a central passageway therein for receiving said molten material;

a gas pressure balance chamber formed annularly inside said walls;

a gas inlet formed in said walls extending from said chamber to the outside of said nozzle body for connection to a supply of gas; and

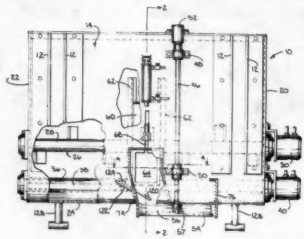
a plurality of communication holes for said gas extending from said chamber to said central passageway, each of said communication holes having a diameter of 0.03 to 0.5 mm.

4,588,113

COMBINED DROP AND BROADCAST SPREADER FOR GRANULAR MATERIAL

Raymond H. Egerdahl, 1208 S. 75th St., West Allis, Wis. 53214

Filed Feb. 8, 1984, Ser. No. 578,376
Int. Cl.[4] E01C *19/20*
U.S. Cl. 222—626 16 Claims



1. A combined drop and broadcast spreader for granular material mountable on a vehicle and comprising:

a hopper for receiving the granular material, said hopper having a bottom containing a row of material discharge holes oriented normal to the direction of travel of the vehicle, said hopper having a side wall lying parallel to the row of holes, said side wall having an opening for passing granular material in the central portion thereof;

a rotatable impeller adjacent the bottom of said hopper above said plurality of discharge holes for forcing granular material to drop from said plurality of holes;

a rotatable broadcast means coupled to said hopper for broadcasting granular material supplied thereto, said rotatable broadcast means being mounted on said side wall in the central portion thereof proximate to said opening; and

housing means on said side wall for directing granular material passing from said opening to said rotatable broadcast means.

4,588,114

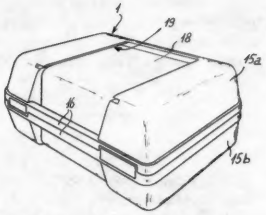
BAGGAGE DEVICE FOR MOTORCYCLES AND THE LIKE

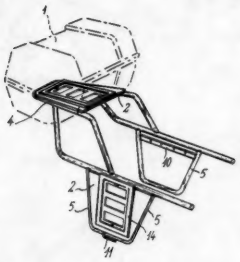
Richard Lebaron, 1, Avenue du Général Balfourier, F-75016 Paris, and Gilles Dumoulin, 12, rue Alfred, F-92140 Clamart, both of France

Filed Jun. 26, 1984, Ser. No. 624,903
Int. Cl.[4] B62J *7/04*
U.S. Cl. 224—32 A 5 Claims

1. In a luggage mount for a motorcycle or the like, comprising a luggage box adapted to be detachably secured to a base member permanently secured to the top platform of a motorcycle luggage carrier, said box being secured by means of a set of guide grooves and a locking system; the improvement in which the base member of said mount comprises two parallel opposite outwardly projecting ledges, the bottom surface of said luggage box has a recessed central portion having grooves along its lateral sides adapted to receive said ledges when said box is positioned on said platform, and a stop member for limiting sliding movement of said box on said ledges in a selected position of said box, said bottom surface of said luggage

box being comprised substantially entirely of three flat parallel surface portions disposed in a series extending from end to end





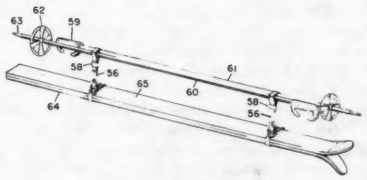
of the luggage box, the central of said three surface portions comprising said recessed portion.

4,588,115

SKI AND SKI POLE CARRIER AND SNOW SCRAPER

Mark H. Uyeda, 3360 Topaz La., J.-15, Fullerton, Calif. 92631

Filed Mar. 11, 1985, Ser. No. 710,106
Int. Cl.[4] A63C *11/02*
U.S. Cl. 224—218 **6 Claims**



1. An improved combination skis and ski poles carrier, snow scraper, ice pick, and ski boots and binding adjustment tool, comprising:

(a) a combination ski holding bracket and duplex rack for edgewise engagement with one of the elongated sides of one of said skis, said rack including an elongated base disposed in intimate face-to-face relationship with one of the skis and having four sides with a pair of rack elements projectiong upwardly from the elongated sides of the base and away from the ski, each of the rack elements having a plurality of complementarily-arranged teeth thereon, with a pair of elongated, oppositely-disposed, complementary slotted portions therein, said bracket disposed on another one of the remaining sides of the base, and an aperture in the base adjacently disposed to the remaining end of the base, oppositely disposed to the bracket;

(b) an elongated scraping element disposed adjacent to said one of said skis and projecting laterally outwardly from the base to serve as a tool for manually scraping snow and/or debris from the skis when the bracket and duplex rack is disengaged from said ski;

(c) a flexible strap formed of cloth material, the oppositely-disposed ends thereof being formed into loops, one loop being captively disposed within the aperture in the base of the duplex rack;

(d) a latching lever and ski boot binding adjusting tool, said lever having a pair of latching legs and a handle thereon and an aperture therein created by a bridging element spanning said pair of legs and being anchored at its extremities to the body of the latching lever and disposed in substantially parallel fashion to one another, the extremities of which have a pair of outwardly extending pegs adapted to operably mate with the complementary slots in said rack and a screwdriver head formed at the opposite end of the lever from the pair of legs, said bridging element being adapted for operative disposition within the free loop of said flexible strap, thereby coupling the latching lever and ski boot binding adjustment tool to the ski holding bracket and duplex rack whereby when the bracket is mounted on the face and edge of one ski and the flexible strap is wrapped around the two skis disposed in lateral, face-to-face relationship, so that the pegs are inserted into the slots of the rack to operatively engage the teeth of said rack and as the handle of the latching lever is manually brought over and into nesting engagement between the upstanding, outwardly directed pair of racks, an over-center latching action occurs and binds the two skis together;

(e) a second double looped strap of cloth material, the first looped portion having a slideable loop tightening means used for tightening the loop about a pair of ski poles when said ski poles are disposed therein;

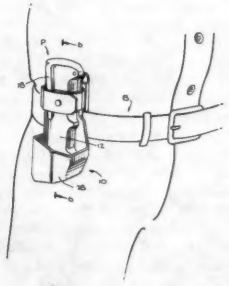
(f) a coupling device consisting of a wire element which includes an engaging portion and a locking stub, and a loop retention portion, the loop retention portion being engageable with the second looped portion of the second double looped strap, and the engaging portion being adapted to be insertable into a complementary pair of slotted portions in the duplex rack, with the locking stub serving to prevent undesirable withdrawal from the slotted portions following engagement therewith.

4,588,116

HOLSTER FOR A CHEMICAL TEAR GAS PROJECTOR

Alan Litman, North Key Largo, Fla., assignor to Smith & Wesson Chemical Company, Inc., Rock Creek, Ohio

Continuation of Ser. No. 556,226, Nov. 29, 1983, abandoned, which is a continuation of Ser. No. 347,407, Feb. 10, 1982, abandoned. This application Sep. 24, 1984, Ser. No. 653,169
Int. Cl.[4] A45F *5/00*
U.S. Cl. 224—253 **16 Claims**



1. A holster for a chemical tear gas projector comprising: an elongated holster body having first and second end por-

tions and an intermediate portion therebetween, said first end portion including an upwardly opening receptacle on one side of said holster body for receiving a portion of the chemical tear gas projector, said second end portion extending along the opposite side of said holster body adjacent and generally parallel to said intermediate portion thereof and defining therewith an opening for receiving a belt for supporting the holster therefrom,

means carried by said holster body for adjusting the size of said opening to enable the holster to be carried by belts of different sizes, said adjusting means including a projection carried by one of said second end portion and said intermediate portion and projecting toward the other of said second end portion and said intermediate portion, said projection defining part of said opening and forming an abutment against which the belt may engage,

means for releasably securing said first and second end portions one to the other, and

means carried by said intermediate portion of said holster body and spaced from said receptacle for releasably engaging the chemical tear gas projector to retain the latter in the receptacle.

4,588,117

CROSS RAIL FOR VEHICLE LUGGAGE CARRIER

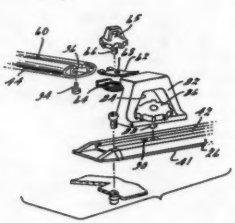
John A. Bott, 931 Lakeshore Dr., Grosse Pointe Shores, Mich. 48236

Continuation of Ser. No. 483,929, Apr. 11, 1983, Pat. No. 4,501,385, which is a continuation of Ser. No. 355,022, Mar. 5, 1982, abandoned, which is a continuation of Ser. No. 171,398, Jul. 23, 1980, abandoned. This application Jan. 4, 1985, Ser. No. 688,965

The portion of the term of this patent subsequent to Feb. 26, 2002, has been disclaimed.

Int. Cl.[4] B60R *9/00*

U.S. Cl. 224—321 **1 Claim**



1. In a luggage carrier disposed on a horizontal surface of an automobile vehicle,

an elongated cross rail member elevated from said surface of said vehicle having a cross section with a generally oval external surface configuration, having a leading edge, a trailing edge, a continuous bottom surface extending from said leading edge to said trailing edge and disposed on a continuous bottom wall portion, a pair of continuous upper surfaces disposed on a pair of continuous upper wall portions, a channel formed between said upper surfaces, including a first pair of interior surfaces parallel to at least a portion of said upper surfaces and a second pair of interior surfaces disposed on a pair of interior walls extending substantially perpendicularly downwardly one from each of said first pair of interior surfaces, each of said interior walls extending from substantially the interior of one of said upper wall portions into contact with the interior of said continuous bottom wall, forming an interior bottom surface of said channel along said bottom wall, and

means for securing said cross rail member to said horizontal surface of said vehicle, said securing means including a supporting end portion disposed at each end of said cross rail member having means adapted to be telescopically engageable with the outer surfaces of said cross rail member and with said channel formed between said upper surfaces for engagement of said cross rail member and each said end portion together, and clamping means including a plurality of spaced channelled elongated members secured by support means to said surface of said vehicle and clampingly adjustably engaging said supporting end portions along the length of said elongated members.

4,588,118

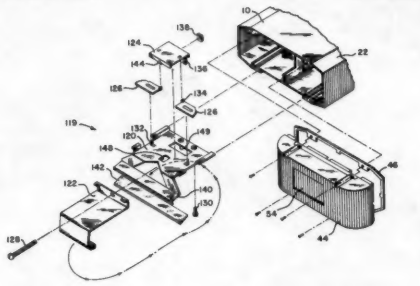
MOUNTING FOOT ASSEMBLY

Robert A. Ferenc, Middletown, and Harold W. Lyons, Deep River, both of Conn., assignors to Whelen Engineering Co., Inc., Chester, Conn.

Filed Feb. 13, 1984, Ser. No. 579,785

Int. Cl.[4] B60R *9/00*

U.S. Cl. 224—331 **9 Claims**



1. A removable mounting foot assembly for supporting an elongated member, the elongated member being comprised of a first material and having a pair of spaced parallel channels therein, said channels being generally U-shaped so as to be open at one side and having bottoms disposed opposite to the open sides, the open sides being in facing relationship, said mounting foot assembly comprising:

base means for supporting a said enlongated member from a surface, said base means including a support foot, said base means being designed to fit between said facing open sides of the channels of the member to be supported;

a pair of cam means for releasably engaging the enlongated member, said cam means each being essentially flat and enlongated and having an irregularly shaped edge portion, said cam means being comprised of a material which is harder than said first material, said cam means edge portions being sized to be received in the channels of the elongated member;

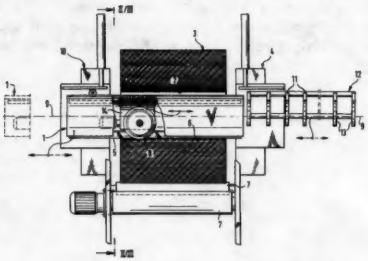
means for mounting said cam means on said base means, said mounting means defining a pair of parallel axes and permitting only rotational motion of said cam means about respective of said axes; and

adjustable locking means, said locking means engaging said cam means and said base means, said locking means retaining said cam means on said base means and being linearly movable relative to said base means, linear movement of said locking means imparting rotational motion in opposite directions about said axes to said cam means whereby said cam means may be simultaneously rotated to cause said irregular edge portions thereof to extend outwardly from said base means and enter said channels throught the open sides thereof and engage the first material at the bottom of the said channels to thereby secure said base means to the elongated member at any desired location along the length thereof.

4,588,119
PROCESS AND APPARATUS FOR OBTAINING INSPECTION SAMPLES FROM WOUND COILS

José Fernandez-Acebal; Jürgen Herm; Harald Tomsen, all of Hamburg, and Walter Wilms, Duisburg, all of Fed. Rep. of Germany, assignors to Blohm & Voss AG, Hamburg, Fed. Rep. of Germany

Filed Mar. 26, 1985, Ser. No. 716,036
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1984, 3411077
Int. Cl.[4] B26F *3/00*
U.S. Cl. 225—2 20 Claims



1. A method of automatically cutting and retrieving for inspection a predetermined sample length from an open inner periphery of a wound coil of elongate material, said coil being wound in a coil winding machine having means for supporting said coil, said method comprising:

inserting machining means into said wound coil inner periphery, said machining means being provided with an actuatable cutter;

using pressure applying means on said inner periphery to hold at least a portion of said inner periphery in place without motion;

cutting a predetermined thickness of said coiled material at a predetermined location of said inner periphery of said coil;

inserting a specimen extraction means into the said inner periphery of said coil and deforming said predetermined sample length of said coiled material at said predetermined location and thereby breaking said predetermined sample length of said coiled material from said coil to form an inspection sample; and

withdrawing said specimen extraction means to retrieve said predetermined sample length for analysis.

4,588,120
APPARATUS AND METHOD FOR FORMING BELT LOOPS AND THE LIKE

Walter W. Frost, and C. Ray Hamilton, both of Vidalia, Ga., assignors to Oxford Industries, Inc., Vidalia, Ga.

Filed Jan. 27, 1983, Ser. No. 461,449
Int. Cl.[4] B27F *7/19*
U.S. Cl. 227—76 30 Claims

1. Apparatus for cutting a continuous length of strip-like material into elongate strips and forming the strips into independent fastened loops such as belt loops and the like, comprising:

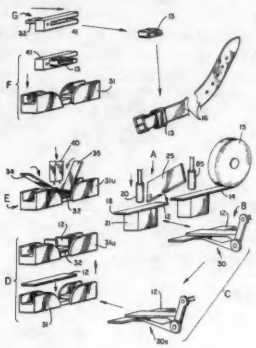
means for drawing the material from a supply;

means for cutting the drawn material into an elongate strip of a predetermined length;

means for forming said strip into a generally u-shape with the ends of said strip extending outwardly;

folding means for engaging said outwardly extending ends of said strip and for folding said ends adjacent each other to form a loop wherein an end of said strip is adjacent the other end;

means defining an opening in said folding means for receiving a fastener; and

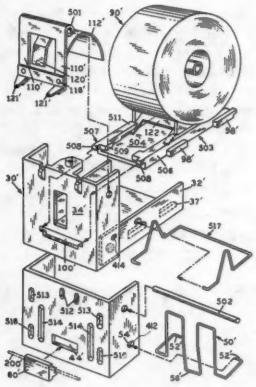


means for fastening said ends of said strip through said opening in said folding means to form a fastened loop.

4,588,121
BELT CARTRIDGE FOR STAPLE FORMING AND DRIVING MACHINE AND METHOD

Paul Olesen, Bellmore, N.Y., assignor to Swingline, Inc., Long Island City, N.Y.

Division of Ser. No. 506,991, Jun. 23, 1983. This application Jan. 14, 1985, Ser. No. 691,049
Int. Cl.[4] B27F *7/11, 7/21, 7/36*
U.S. Cl. 227—120 3 Claims



1. In a staple wire belt cartridge adaptable for feeding staple wires to a stapler having a former-driver arrangement which cartridge includes a housing section for holding a rolled belt of staple wires and an exit portion from which the belt of wires exits as the belt is unrolled, the improvement in such exit portion comprising

(a) upper parallel spaced-apart belt guides integrally formed with and extending a selected distance from the housing section of the cartridge for guiding the staple wires of the belt to limit upward movement of such staple wires;

(b) a lower belt guide means positioned below the upper guides and extending less than the said selected distance from such housing for guiding such staple wires to limit their downward movement; and

(c) an opening area in said exit portion between said upper

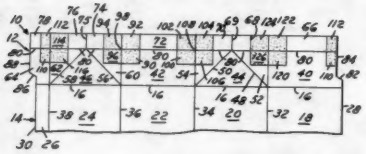
belt guides for accommodating the formerdriver arrangement.

4,588,122

IN-FOLDED FIN SEAL END CLOSURE

Robert E. Lisiecki, Farmington Hills, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Sep. 3, 1985, Ser. No. 771,950
Int. Cl.[4] B65D 5/42
U.S. Cl. 229—17 R **2 Claims**



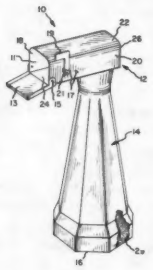
1. In a blank for constructing a container adaptable to being folded into a flat end container, wherein the blank includes five body portion panels interconnected by longitudinal score lines, five end closure panels connected via a first row of lateral score lines to respective ends of the body portion panels and separated by said longitudinal score lines; said five end closure panels including two panels having triangular closure panels respectively connected to the ends of two alternate body portion panels, and inner closure panels respectively connected to the ends of the other three alternate body portion panels; a pair of triangular fold-out panels connected via diagonal score lines to the opposite sides of each of said triangular closure panels; full width sealing panels respectively connected via a second row of lateral score lines to said inner closure panels; and a pair of half-width sealing panels respectively connected via said second row of lateral score lines to each pair of triangular fold-out panels; the improvement comprising four sets of four areas having a suitable anti-sealant applied thereto, said areas being located on adjacent quadrants of the outside surfaces of each inner closure panel, triangular fold-out panel, full width sealing panel, and half-width sealing panel for providing controlled slippages between adjacent panels to eliminate buckling and consequent cracking at 180° bend locations.

4,588,123

SELF-SUPPORTING MAIL BOX

Randolph L. Plew, R.R. #3, Rd 150 N, Columbia City, Ind. 46725

Filed Feb. 26, 1985, Ser. No. 705,654
Int. Cl.[4] B65D 91/00
U.S. Cl. 232—39 **15 Claims**



1. A self-supporting mailbox comprising:

a unitary, hollow body including a hollow box and hollow rigid base having an opening provided therebetween, said opening facilitating the addition of a ballast material to the base,

said hollow box having an open end through which mail may be inserted and withdrawn from said box, a rear wall opposite said open end, a bottom and opposed side walls; and

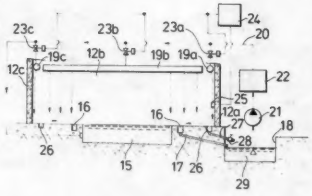
said hollow rigid base depending from and being integrally formed with said box, said base extending generally perpendicular to the bottom to maintain said mailbox and its contents at a selected distance above the ground, said base having a basal plate and lateral surfaces forming a cavity therein, said basal plate being in contact with the ground and the cross-sectional area of the basal plate being greater than the cross-sectiional area of the base directly adjacent the bottom of said box.

4,588,124

HEAT-EXCHANGING SYSTEM FOR AN ENCLOSED SPACE

Junzo Takata; Michio Jinushi; Mitsuo Hashizume, and Mitsugu Kobayashi, all of Kanagawa, Japan, assignors to Takenaka Komuten Co., Ltd., Osaka and Nankoso Company Ltd., Kanagawa, both of, Japan, a part interest

Filed Oct. 3, 1984, Ser. No. 657,364
Claims priority, application Japan, Oct. 4, 1983, 58-185622; Oct. 4, 1983, 58-185623; Oct. 4, 1983, 58-185624
Int. Cl.[4] F24D 3/00
U.S. Cl. 237—1 R **12 Claims**



1. For use in regulating the temperature in an enclosed space having at least one structural wall-forming member having both thermal storage and heat-insulating properties and having an interior surface directed inwardly of the enclosed space not normally intended for directly receiving solar radiation, a heat exchanging system comprising storage means for storing a body of heat exchanging liquid, means for directing flow of heat exchanging liquid downwardly along the interior surface of the wall-forming member, pump means for pumping the heat exchanging liquid from the storage means to the flow directing means for causing flow thereof downwardly along the interior surface of the wall-forming member to cause heat transfer between the wall-forming member and the heat exchanging liquid whereby to maintain a temperature of the wall-forming member commensurate with a temperature of the heat exchanging liquid, thereby to bring about heat transfer between the wall-forming member and the enclosed space for maintaining the enclosed space at a desired temperature, and flow return means for returning to the storage means the heat exchanging liquid which has flowed downwardly along the interior surface of the wall-forming member for cycling of the heat exchanging liquid.

4,588,125

LIQUID SURFACE HEATING SYSTEM FOR FLOORS

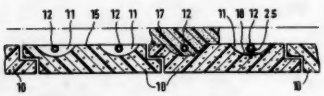
Hans Lutz, Berggasse 122, 7410 Reutlingen 1, Fed. Rep. of Germany

Filed Jan. 6, 1984, Ser. No. 568,800

Claims priority, application Fed. Rep. of Germany, Jan. 11, 1983, 3300607

Int. Cl.[4] F24D 3/14

U.S. Cl. 237—69 6 Claims



1. A liquid-surface-heating system for heating a floor including a primary layer having a plurality of adjoining elements of heat-isolating material and a finish layer, the system comprising a plurality of heating tubes disposed in the floor in a bifiler or meander-like manner and each having a peripheral surface, said elements having plane upper surfaces and including a plurality of longitudinal webs and a plurality of elongated depressions separated from each other by said longitudinal webs, said depressions each having a concavely curved bottom surface and a width which is much greater than a diameter of said heating tubes and is also greater than the width of each longitudinal web; and holding means for holding said heating tubes in said depressions beneath said upper surfaces but at a predetermined distance from the curved bottom surfaces of said depressions so that when the finish layer is applied onto said primary layer the mass of the finish layer fills said depressions and immediately surrounds the entire peripheral surface of each heating tube.

4,588,126

METAL ELEMENT FOR FASTENING A RAIL TO A CONCRETE TIE

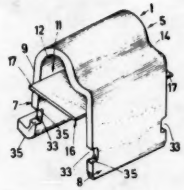
René J. Foulart, La Louviere, Belgium, assignor to Fagrobel S.A., La Louviere, Belgium

Filed May 30, 1984, Ser. No. 615,457

Claims priority, application Belgium, May 31, 1983, 210881; European Pat. Off., Sep. 21, 1983, 83870094.6; Belgium, May 24, 1984, 213004

Int. Cl.[4] E01B 9/30

U.S. Cl. 238—310 6 Claims



1. In a metal element to be inserted into a mold cavity of a mold employed in the casting of a concrete tie, and for use in securing a rail to said tie, said metal element including an elongate substantially U-shaped member providing a central transversely curved portion for cooperation with a securing clip, and a pair of legs to be secured within said cast concrete tie by the casting of a concrete admixture around said legs, the improvement comprising;

a metal plate extending transversely between said legs and substantially perpendicular thereto;

said metal plate being spaced from said curved portion to define a socket for the reception of a leg of a rail securing clip, and, extending uninteruptedly between axially opposed end faces of said metal element;

said metal plates providing a closure for said mold cavity and being operative to isolate said socket from concrete admixture employed in the casting of a railroad tie.

4,588,127

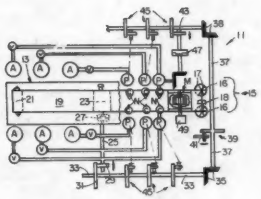
MATERIAL-SPREADING FIELD VEHICLE HAVING MEANS FOR ON-SITE METERING AND MIXING OF SOIL-TREATING CHEMICALS

Arthur H. Ehrat, c/o Farmers Elevator Co., Lowder, Ill. 62662

Filed Jul. 30, 1982, Ser. No. 403,370

Int. Cl.[4] B05B 9/06

U.S. Cl. 239—156 3 Claims



1. A solid-material-spreading field vehicle having a front and a rear end including a frame and a drive shaft, comprising: a solid-material-holding hopper; a solid-material-spreading mechanism; a solid-material-feeding conveyor connected between said hopper and said spreading mechanism; said spreading mechanism mounted from said vehicles at the rear thereof and having a plurality of laterally spaced material-spreading elements fed with material by and from said conveyor; a churning-type mixer overlying said conveyor immediately upstream from said spreading mechanism; a plurality of separate unrelated simultaneously usable auxiliary liquid material additive tanks all supported from said vehicle frame; said solid-material-feeding conveyor being fed with liquid from a plurality of said simultaneously usable auxiliary tanks through permanently-connected manual-valved feed lines; a control valve means and a positive-volume feed pump means in each of said feed lines; a vehicle-speed responsive mechanism operatively connected to said drive shaft of said vehicle; each of said positive feed pump means being separately driven by said vehicle-speed-responsive mechanism connected to said drive shaft of said vehicle with each of said feed pump means having a selectively independent variable drive; and said vehicle-speed-responsive mechanism including speed-ratio-changing means to effect a metering operation of said conveyor and of said pump for thereby metering solid material from said conveyer and liquid from selected ones of said tanks in correlated ratios for providing uniform material applications.

4,588,128

FOLDING BOOM FOR AGRICULTURAL SPRAYERS

Roy F. Broyhill, and Craig G. Broyhill, both of Dakota City, Nebr., assignors to The Broyhill Company, Dakota City, Nebr.

Filed Feb. 25, 1985, Ser. No. 704,864

Int. Cl.[4] B05B 1/20

U.S. Cl. 239—168 5 Claims

1. A wheeled frame means having rearward and forward ends,

a center frame section mounted on said wheeled frame means and having upper and lower portions and opposite ends, said frame section being disposed transversely to the direction of travel of said wheeled frame means,

first and second boom assemblies mounted at the opposite

ends of said center frame section and normally extending laterally outwardly therefrom,

each of said first and second boom assemblies comprising inner, intermediate and outer boom sections,

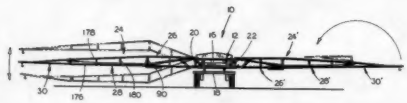
each of said inner boom sections comprising an upper boom arm operatively pivotally secured about horizontal and vertical axes to one end of said center frame section and a normally horizontally disposed lower boom arm operatively pivotally secured about horizontal and vertical axes to said one end of said center frame section,

first resilient means operatively connecting said inner boom section to said center frame section for yieldably resisting the rearward pivotal movement of said inner boom section, relative to said center frame section,

an upstanding post means pivotally secured about horizontal axes to the outer ends of said upper and lower boom arms of said inner boom section,

a spring means connected to said inner boom section for yieldably maintaining said lower arm of said inner boom boom section in a generally horizontally disposed position,

each of said intermediate boom sections including at least an upper boom arm and a normally horizontally disposed lower boom arm and being pivotally connected about a



vertical axis to said upstanding post means of said inner boom section,

a second spring means operatively connected to said intermediate boom section to yieldably maintain said intermediate boom section parallel to said inner boom section but permitting said intermediate boom section to move rearwardly if either of said intermediate or outer bocm sections strike an obstruction,

each of said outer boom sections being pivotally secured about a horizontal axis to the outer end of said intermediate boom section,

said outer boom section including at least a normally horizontally disposed lower boom arm which is normally generally parallel to said lower boom arm of said intermediate boom section,

a third spring means connected to said outer boom section to yieldably prevent the upward pivotal movement of said outer boom section relative to said intermediate boom section,

and actuator means connected to and extending between said outer boom section and said inner boom section whereby the outer end of said outer boom section will be pivotally moved upwardly, relative to said intermedite boom section, and said inner boom section moves downwardly relative to said center frame section.

4,588,129

NEBULIZER

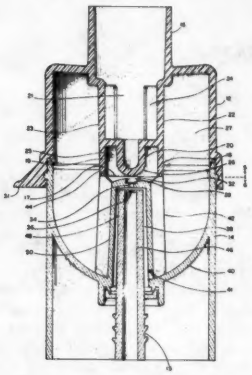
Thomas P. Shanks, Temecula, Calif., assignor to Hudson Oxygen Therapy Sales Company, Temecula, Calif.

Filed Sep. 6, 1983, Ser. No. 529,511

Int. Cl.[4] A61M *11/00*

U.S. Cl. 239—338 **7 Claims**

1. In a nebulizer having a spray orifice means for directing an aerosol upwardly therefrom to an otulet pipe, and a target between said spray orifice means and said outlet pipe against which said aerosol is directed, the improvement comprising: said target having a convex surface forming an impingement surface facing said spray orifice means and a hood having an annular skirt with a bottom edge forming a single circular portion, the hood being otherwise enclosed, the center of said convex surface being substantially coaxial with said spray orifice means and centered relative to said circular port wherein said spray orifice means is circular and said convex surface has a diameter greater than the diameter of said orifice, and the diameter of said circular port is greater than the diameter of said target, said spray orifice means comprising a spray nozzle orifice and a second spray orifice, said spray nozzle orifice being spaced further from said target than said second spray orifice, the distance between said spray nozzle orifice



and the center of said target surface being at least as great as the diameter of said spray nozzle orifice, wherein the diameter of said second spray orifice is greater than the diameter of said spray nozzle orifice and adapted to limit the size of an aerosol cone sprayed from said spray nozzle orifice and wherein an outer limit of a cone created by extending a straight line from the edge of said spray nozzle orifice and the edge of said second spray orifice must intersect said target impingement surface whereby all of said aerosol cone impinges said target surface.

4,588,130

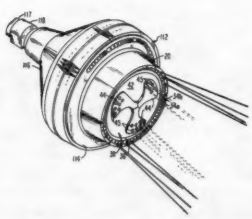
SHOWERHEAD

John M. Trenary, and Joseph G. Mammoser, both of Fort Collins, Colo., assignors to Teledyne Industries, Inc., Fort Collins, Colo.

Filed Jan. 17, 1984, Ser. No. 571,577

Int. Cl.[4] B05B *3/06*

U.S. Cl. 239—381 **8 Claims**



1. In a showerhead that has an inlet, a series of circumferentially-spaced orifices, a series of spray outlets, a turbine with a valve for sequentially opening successive ones of said orifices, at least one nozzle for driving said turbine, a multiply-apertured flow director for communicating water to said nozzle, said orifices and said outlets, a control for selectively coupling water from said inlet to different ones of the apertures in said

director and means for moving said control relative to said director, the combination comprising:

means in said showerhead defining a first passage from at least a first aperture in said director to said nozzle and through said valve to said orifices;

means in said showerhead defining a second passage from at least a second aperture in said director in bypass of said nozzle but through said valve to said orifices and in retardive interaction with said turbine;

means in said showerhead defining a third passage from at least a third aperture in said director to said outlets;

first shutter means defined on said control for closing said third passage, opening said first passage and variably opening said second passage during opening of said first passage as said control is moved;

second shutter means defined on said control for closing said first and second passages, while opening said third passage as said control is moved;

and said first and second shutter means being mutually oriented to at least partially open said second passage when said control is moved to a position in which both of said first and third passages are at least partially opened.

4,588,131

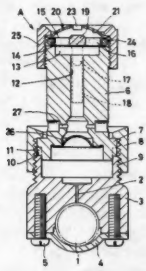
NOZZLE FOR SPRAYING AGRICULTURAL CHEMICALS

Kenzo Yamamoto, and Kenji Bessho, both of Wakayama, Japan, assignors to Yamaho Kogyo Co., Ltd., Wakayama, Japan

Filed Mar. 2, 1984, Ser. No. 585,590

Int. Cl.[4] B05B *7/00*

U.S. Cl. 239—428.5 **2 Claims**



1. A spray nozzle for spraying a liquid, comprising:

a body formed with a bore extending longitudinally therethrough;

a core mounted on the top of said body and formed with a first rib means on top thereof and with a notch at each side of said first rib means;

hole means, arranged in the body, and first projection means, directed downwardly from the core, for cooperatively preventing the core from turning with respect to the body;

an orifice plate mounted on said core and having a downstream side;

a second rib means, formed on the downstream side of the orifice plate, for cooperating with the first rib means on the core so that the orifice plate is prevented from turning with respect to the core, said second rib means on said orifice plate being hollow to receive therein said first rib means on said core, said second rib means on said orifice plate being formed with a port in the center thereof;

a first nut means for clamping the core and the orifice plate on the body;

a spray pipe;

a seat member mounted on the spray pipe at a desired angle and communicating with the inside of said spray pipe;

a second nut means for clamping the body on the seat member; and

notch means, arranged in the seat member, and second projection means, arranged on the body, for cooperatively preventing the body from turning with respect to said seat member;

whereby the liquid passes up through said bore in said body, through said notches in said core, into said hollow second rib means on said orifice plate and spouts out through said port in said second rib means on said orifice plate in a fan-like shape; and

further whereby said body, said core, and said orifice plate are positioned with respect to said seat member and said spray pipe at a uniformly desired angle.

4,588,132

FUEL-INJECTION NOZZLE

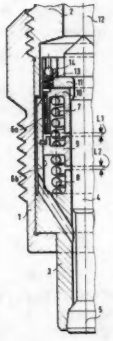
Alfred Neitz, Wendelstein, Fed. Rep. of Germany, and Michael L. Monaghan, Downsway, Great Britain, assignors to Maschinenfabrik Augsburg-Nurnberg, Oberhausen, Fed. Rep. of Germany

Filed Apr. 18, 1984, Ser. No. 601,633

Claims priority, application United Kingdom, Apr. 26, 1983, 8311336

Int. Cl.[4] B05B *1/32*

U.S. Cl. 239—453 **3 Claims**



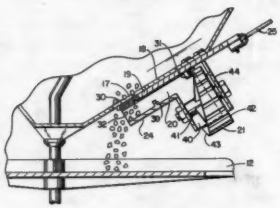
1. A fuel-injection nozzle for a direct-injection internal combustion engine, comprising a nozzle body, a nozzle needle longitudinally movable in a nozzle body in a direction outwardly of said nozzle body to open the nozzle and in a direction inwardly of said nozzle body to close the nozzle, and means for opening said nozzle at a slower rate at lower engine speeds and loads and at a faster rate at upper engine speeds and loads, and in which nozzle the nozzle needle is movable to open the nozzle by means of fuel pressure against spring bias, the nozzle further comprising a primary spring controlling a first stroke of the nozzle needle at said slower rate of opening and a secondary spring controlling a second stroke of the nozzle needle at said faster rate of opening, a preliminary-stroke piston and a main piston slidably movable in the nozzle body, said primary spring being arranged between said preliminary-stroke piston and one side of said main piston, and said secondary spring being arranged between a surface in the nozzle body and the other side of said main piston, and at least one control opening provided in the preliminary-stroke piston to allow fuel to escape from between the preliminary-stroke piston and the main piston during the said first stroke of the nozzle needle.

4,588,133

COMBINED CHUTE AND VARIABLE RATE CONTROL ASSEMBLY FOR A BROADCAST SPREADER

James D. Brabb, London, and Dennis L. Simpson, Marysville, both of Ohio, assignors to White Castle System, Inc., Columbus, Ohio

Filed Jul. 18, 1984, Ser. No. 631,886
Int. Cl.[4] B65D *47/28;* A01C *17/00*
U.S. Cl. 239—681 1 Claim



1. In a broadcast spreader for distributing granular or pelletized material, said spreader having a hopper provided with a discharge port, a shutter disposed below said discharge port in close proximity thereto for movement between a closed position and a plurality of open positions, and an impeller spaced below said shutter, that improvement which comprises:

(a) a material-directing chute formed with a pair of laterally spaced apart legs connected to the hopper, a material-directing web portion extending from one leg to the other leg in spaced relation to and between the shutter and the impeller, and an end wall formed with a dial-viewing opening; and

(b) variable flow rate regulating means rotatably mounted on the chute and movable selectively between a plurality of settings to releasably engage the shutter and limit opening movement thereof, said flow rate regulating means including a setting-indicating dial disposed in close proximity to the end wall of said chute and having symbols thereon viewable through the dial-viewing opening of said end wall.

4,588,134

METHOD OF TREATING POLLEN FOR PULVERIZATION THEREOF AND EXTRACTION OF ESSENCE THEREFROM

Shinichi Shimizu, Kounosu; Tetuo Rikiishi, Kasukabe, and Yasuo Koyama, Kounosu, all of Japan, assignors to Saitama Bee-Keeping Co., Ltd., Kounosu, Japan

Filed Jul. 18, 1984, Ser. No. 632,155
Claims priority, application Japan, Jul. 18, 1983, 58-129346
Int. Cl.[4] B02C *19/12*
U.S. Cl. 241—21 4 Claims

1. A process for preparing an extraction product from pollen grains, which comprises:

freezing said pollen grains by immersing said pollen grains in a low temperature liquefied gas, thereby making said pollen grains low temperature brittle,

removing said pollen grains from said low temperature liquefied gas,

pulverizing said pollen grains while said pollen grains are still low temperature brittle by means of a pulverizer of impact type,

adding an aqueous ethanol solution, as a solvent, to said pulverized pollen grains, said aqueous ethanol solution being added in an amount 6–10 times the weight of said pulverized pollen grains,

extracting effective ingredients of said pollen grains at room to elevated temperature for 1–3 hours with stirring,

removing a residue of said pollen grains, and

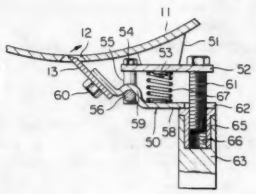
concentrating the resulting extract solution under vacuum until a clear, syrupy extraction product is obtained.

4,588,135

MOUNTING MEANS FOR CUTTING BLADE OF FOOD-CUTTING APPARATUS

Kohei Himi, Mie, Japan, assignor to Chubu Industries, Inc., Mie, Japan

Filed Oct. 4, 1984, Ser. No. 678,200
Claims priority, application Japan, Jul. 31, 1984, 54-117481
Int. Cl.[4] B02C *17/02;* B26D *7/06;* B07B *13/00*
U.S. Cl. 241—84 1 Claim



1. A food-cutting apparatus wherein a cutting blade is disposed on a back surface of a cutting plate so as to protrude its front tip from a opening provided in said cutting plate, characterized in that:

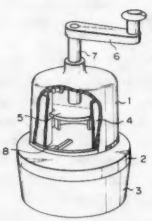
a supporting plate is fixed to said back surface of said cutting plate near said opening; a pair of arms are provided on a reverse side surface of said supporting plate with respect to said cutting plate; between said pair of arms a supporting rod is interposed and axially supported; an engaging recess formed in a middle portion of a mounting plate for said cutting blade is rotatably mounted on said supporting rod in a saddling manner at a side of said supporting rod opposite to said supporting plate, in a front portion of which mounting plate said cutting blade is disconnectably connected; a length of said mounting plate between opposite ends thereof is shorter than that of an interval between said pair of arms; a spring means is interposed between said mounting plate and said supporting plate behind said engaging recess; and an adjusting means for adjusting a protruding amount of said front tip of said cutting blade is disconnectably connected between a rear portion of said mounting plate and said supporting plate.

4,588,136

FOOD SHAVING APPARATUS

Shinobu Homma, Tokyo, Japan, assignor to Kabushiki Kaisha Honma, Tokyo, Japan

Filed Nov. 21, 1984, Ser. No. 673,626
Claims priority, application Japan, Sep. 5, 1984, 59-133872[U]
Int. Cl.[4] B02C *18/00*
U.S. Cl. 241—95 6 Claims



1. An apparatus for shaving an object such as an ice cube comprising:

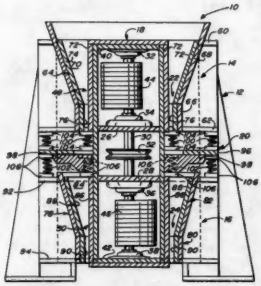
a reservoir for containing shavings from said object,
a cutter blade disposed above said reservoir,
a rotating cylinder having a central axis and supported for rotation about the axis, said rotating cylinder holding the object to be shaved, and having at least one projecting portion engaging with said object, the object being rotated to be shaved by said cutter blade,
an inverted cup-shaped casing covering said rotating cylinder, and
means supported by the casing for rotating said rotating cylinder about the axis thereof, comprising a rod extending through a hole formed in said casing, a pressure plate housed in said rotating cylinder and connected to one end portion of said rod, means mounting the pressure plate in the rotating cylinder such that the pressure plate rotates with the cylinder and moves relative thereto along said central axis, said pressure plate being formed with a notch engaging with said at least one projecting portion, a handle disposed outside of said casing and connected to the other end portion of said rod to rotate the pressure plate with said rotating cylinder as one body about the central axis thereof while simultaneously pressing the pressure plate downwardly towards the cutter blade.

4,588,137

VIBRATORY CRUSHER

David P. McConnell, Jr., 1515 S. Extension Rd., Apt. #2164, Mesa, Ariz. 85202

Filed Feb. 28, 1984, Ser. No. 584,325
Int. Cl.[4] B02C *2/04*
U.S. Cl. 241—156 **19 Claims**



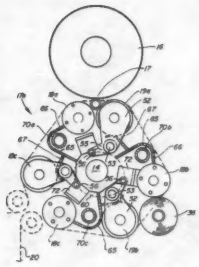
1. A crusher comprising
a supporting frame structure,
first and second reaction collars mounted in spaced apart relation upon said structure,
an elongated mandrel having a shaft extending along an axis of said mandrel and supported for rotation relative to said mandrel by bearing means, eccentric masses being mounted in opposed offset relation on opposite ends of said shaft,
resilient support means providing floating support for said mandrel with its opposite ends respectively arranged within said first and second spaced apart reaction collars, and
drive means for driving said shaft in rotation whereby the eccentric masses on said shaft cause the ends of said mandrel to gyrate relative to the reaction collars for producing a vibratory crushing effect therebetween.

4,588,138

WEB WINDING MACHINE

Harvey J. Spencer, Green Bay, Wis., assignor to Paper Converting Machine Company, Green Bay, Wis.

Filed Jun. 29, 1984, Ser. No. 626,371
Int. Cl.[4] B65H *18/16, 18/20*
U.S. Cl. 242—64 **27 Claims**



1. An apparatus for winding a web of sheet material into a roll on a core comprising:
(a) a frame,
(b) a pair of rollers for supporting the core rotatably mounted on the frame and having a space therebetween,
(c) a vacuum chamber outside said rollers within the frame communicating with the space between the rollers, the space between the rollers being sized to support a core and thereby close said chamber, and
(d) means for reducing the air pressure in the vacuum chamber and for holdin a core for a roll in the sapce between the rollers by air pressure and the web can be wound on the core by rotating the core with the rollers.

19. A method of winding a core with a web of sheet material comprising the steps of:
(a) reducing the air pressure in a space between a pair of rollers,
(b) inserting a core in said space and holding the core against the rollers by air pressure,
(c) rotating the roliers to rotate the core, and
(d) attaching the web to the core and winding the web on the rotating core.

4,588,139

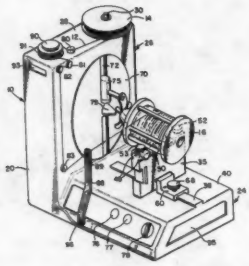
APPARATUS FOR WINDING FISHING LINE ONTO A FISHING REEL

Jennifer Lines, Duart Fairylands, 6 Mills Shares Rd., Pembroke, Bermuda

Filed Sep. 21, 1984, Ser. No. 653,499
Int. Cl.[4] A01K *89/00;* **B65H** *75/00*
U.S. Cl. 242—84.1 M **25 Claims**

2. An apparatus for winding fishing line from a supply means onto either a crank-type fishing reel or a crankless fishing reel comprising:
(a) a frame,
(b) reel winder means on the frame for engaging and driving the reel to wind fishing line from the supply means onto the reel;
(c) fishing reel support means for supporting the reel at a desired position in engagement with the reel winder means to drive the reel, said fishing reel support means having a guide track on the frame and a reel support member configured to be mounted on the frame in a first orientation for supporting a crank-type reel in engagement with the reel winder means and configured to be mounted on the frame in a second orientation for supporting a crankless reel in engagement with the reel winder means, said reel support member having first holder means for

releasably holding and supporting a crank-type reel in engagement with said winder means; second holder means cooperable with said winder means for releasably holding and supporting a crankless reel on the reel support member in engagement with said winder means; and first and second guide track engagement means for engaging the guide track to support the reel support member on the frame, one of said engagement means adapted to mount the member in its first orientation so that the first holder



means supports a crank-type reel in driving engagement with winder means and the other of said engagement means adapted to mount the reel support member in its second orientation so that the second holder means supports a crankless reel on the reel in driving engagement with the reel winder means; and

(d) fishing line guide means on the frame for guiding the fishing line from the supply means onto the fishing reel supported on the frame.

4,588,140

REVERSE PREVENTION DEVICE FOR FISHING REEL

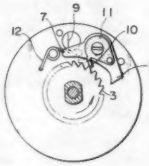
Kazuo Hirano, Tokyo, Japan, assignor to Daiwa Seiko, Inc., Higashikurume, Japan

Continuation of Ser. No. 513,414, Jul. 14, 1983, abandoned, which is a continuation-in-part of Ser. No. 313,193, Oct. 20, 1981, abandoned. This application Sep. 6, 1985, Ser. No. 773,525

Claims priority, application Japan, Nov. 14, 1980, 55-162929

Int. Cl.[4] A01K *89/01*

U.S. Cl. 242—84.2 R **16 Claims**



1. In a spinning reel for fishing having a rotor retaining a fishing line and fixed to a rotary shaft sleeve adapted to rotate via a drive mechanism actuated by rotation of a handle shaft so that fishing line is wound up on a spool by rotation of said handle shaft, a device for selectively preventing rotation of said shaft sleeve, comprising:

a toothed ratchet wheel fixed to said drive mechanism;

a pawl pivotally mounted for engagement with said ratchet wheel to selectively prevent rotation thereof;

cam means carried by said reel housing for switching said pawl between an operative position in which free rotation of said ratchet wheel is permitted in a first direction only, and an inoperative position in which free rotation of said ratchet wheel is permitted in both said first direction and a second opposite direction;

a member constructed of resilient material, said member being secured to said pawl and including a flexible tab formed unitarily with said member, said tab extending away from said member toward said ratchet wheel and engaging the teeth thereof, said tab being pivotable about its juncture with said member between a first position when said rotary shaft sleeve is rotated in said first direction, and a second oppositely directed position when said rotary shaft sleeve is rotated in said second direction, said tab being sufficiently flexible to permit free rotation of the ratchet wheel in both directions when said pawl is in its inoperative position;

movement of said tab to its first position when said pawl is in its operative position causing said pawl to be pivoted out of engagement with said ratchet wheel, and movement of said tab to its second position when said pawl is in its operative position causing said pawl to be pivoted into engagement between any two adjacent teeth of said ratchet wheel.

4,588,141

HANDLE FOR A FISHING SPINNING REEL

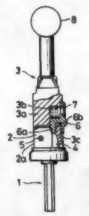
Haruo Uetsuki, and Toshiaki Yorikane, both of Hiroshima, Japan, assignors to Ryobi Ltd., Hiroshima, Japan

Continuation of Ser. No. 473,916, Mar. 10, 1983, abandoned. This application Apr. 3, 1985, Ser. No. 720,043

Claims priority, application Japan, Mar. 15, 1982, 57-36622[U]

Int. Cl.[4] A01K *89/00;* **G05G** *1/10*

U.S. Cl. 242—84.1 J **2 Claims**



1. A handle for a spinning reel for fishing including a handle shaft, and a handle arm connected to said handle shaft, comprising: said handle shaft having a substantially rectangular shaped end projection, said end projection having a first surface extending substantially in parallel with axial direction of said handle shaft, and a second surface extending substantially perpendicular thereto; said handle arm provided with a channel-shaped groove in which said end projection is received, means for pivotally connecting said handle arm to said end projection, and rotatable between a first position in which it is coaxial with said handle shaft and a second position in which it is perpendicular to said handle shaft, said handle arm being also provided with a recess contiguous to said groove; a slider in said recess, said slider having a beveled front end surface engageable with one of said first surface and said second surface of said end projection; and a spring disposed in said recess for urging said slider into locking engagement with one of said first and second surfaces when said handle arm is in said one of first and second positions, said first position being maintained by surface contact between said beveled front end surface of said slider and said first surface of said end projection, while said second position being maintained by surface contact between said beveled front end surface and said second surface of said end projection, and positional switching being made by manually urging said slider against biasing force of said spring.

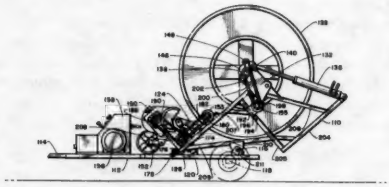
4,588,142
CABLE SPOOLING SYSTEM

Fred H. Malzacher, 5530 Rushmore St., Ventura, Calif. 93003

Continuation-in-part of Ser. No. 284,691, Jul. 20, 1981, abandoned. This application Sep. 10, 1984, Ser. No. 649,274

Int. Cl.[4] B65H *75/00, 75/40*

U.S. Cl. 242—86.5 R **23 Claims**



1. A mobile cable spooling system comprising;
chassis means;
tiltable frame means mounted on said chassis means;
an axle for mounting a cable spool;
support means on said tiltable frame for supporting said axle and spool;
drive means for rotatably driving said axle and spool;
said drive means comprising:
hydraulic pump means;
a hydraulic motor;
hydraulic valve means connecting said hydraulic pump means to said hydraulic motor;
said hydraulic pump means comprising a pressure compensated hydraulic pump providing self-compensation of the rotational speed of said axle and spool; and
tilt means for tilting said tiltable frame from a first position for use as a stationary platform resting on the ground to a second position for transporting said axle and spool.

4,588,143
STATOR WINDING MACHINE

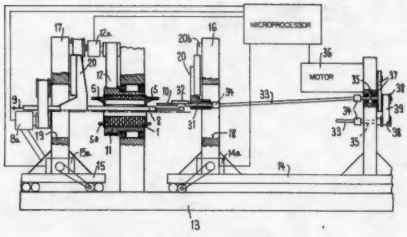
Max Hetzel, Deitingen, Switzerland, assignor to K & S Schrittmotoren GmbH, Schwabach, Fed. Rep. of Germany

Filed Oct. 11, 1983, Ser. No. 540,382

Claims priority, application Switzerland, Oct. 22, 1982, 6152/82

Int. Cl.[4] H02K *15/085*

U.S. Cl. 242—1.1 R **13 Claims**



1. An apparatus for winding an annular ferromagnetic body for a rotating electric machine, the body having axial and radial axes, a central bore having slots therein, each slot having a radial depth and an axial length, for receipt of loops of wound wire coils, and a pair of opposed first and second faces, said apparatus comprising:
(a) a body support;
(b) a wire delivering member cooperating with said support, having a wire delivering bore for feeding of wire therethrough to be wound on the body;
(c) first positioning means, mechanically coupled to said wire delivering member, for positioning said wire delivering member proximate the first face of the body, and for translating said wire delivering member relative to the body along the axial axis through the body bore toward the second face of said body, and along the radial axis;
(d) a wire receiving member cooperating with said body support, having means for capture of wire by rotation of said wire receiving member;
(e) second positioning means, coupled to said wire receiving member, for positioning said wire receiving member proximate the second face of the body, for translating said wire receiving member relative to the body along the axial and radial axes, and for rotating said wire receiving member; and
(f) control means, electrically connected to said first and second positioning means, coordinating translation and rotation of said wire delivering member and said wire receiving members, for actuating translational movement of said wire delivering member through the body bore towards the second face thereof, actuating said wire receiving member to capture wire from said wire delivering member and translating the wire relative to the body and releasing the wire, and translating said wire delivering member through the body bore back to the first face thereof to form a coil loop.

4,588,144
WEBBING RETRACTOR

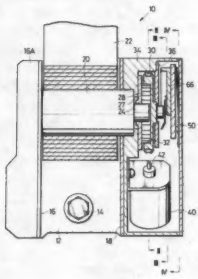
Yuji Nishimura, Aichi, Japan, assignor to Kabushiki Kaisha Tokai-rika-denki-seisakusho, Aichi, Japan

Filed Sep. 13, 1984, Ser. No. 650,349

Claims priority, application Japan, Sep. 13, 1983, 58-141885[U]

Int. Cl.[4] B60R *22/44;* **B65H** *75/48*

U.S. Cl. 242—107 **17 Claims**



1. A webbing retractor for retracting an occupant restraining webbing which is adapted for use in a seatbelt system for a vehicle, comprising:
(a) a webbing takeup shaft for retracting one end portion of the webbing thereon;
(b) a resilient means having first and second end portions wherein said resilient means is secured at said first end portion to the takeup shaft for biasing the takeup shaft in a direction of a webbing retraction;
(c) a drive means connected to the second end portion of the resilient means for driving the second end portion of the resilient means in order to change the biasing force of the resilient means acting upon the takeup shaft;
(d) position detecting switch means for detecting the position of the second end portion of the resilient means driven by the drive means;
(e) a direction detecting switch means for detecting the direction that the second end portion of the resilient means is driven by the drive means which is switched on and off through a lost motion mechanism when said second end portion of the resilient means is initially driven; and
(f) a control means for controlling the drive means in response to detected signals outputted from the position

detecting switch means and from the direction detecting switch means,

whereby a sense of oppression felt by the occupant restrained by the webbing can be prevented.

4,588,145

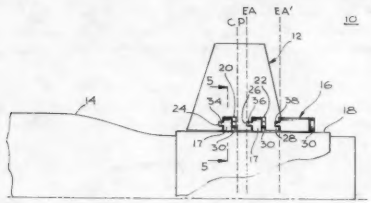
MISSILE TAIL FIN ASSEMBLY

Ronald T. Inglis, Laguna Beach, Calif., assignor to General Dynamics Pomona Division, Pomona, Calif.

Filed Aug. 15, 1983, Ser. No. 523,472

Int. Cl.[4] F42B *15/02*

U.S. Cl. 244—3.24 **12 Claims**



1. A missile tail fin assembly for maintaining the roll rate of the missile within a predetermined range independent of variations in missile angle of attack comprising:

at least one pivotably mounted tail fin;

a fixture provided on the aft portion of said missile, said fixture including a plurality of members extending therefrom and including a key-shaped portion formed on each said member for engaging an associated fin;

a set of complementary notches formed on said fin and arranged to receive the key-shaped portions when the fin is in a predetermined angular position extending outwardly from the fixture, said notches being located at various positions along the fin forward and rearward, respectively, of a center line of the fin, at least the most rearward notch being shaped to lock the key-shaped portion received therein in a fixed angular position and the notches forward of the most rearward notch being shaped with predetermined cutout portions to permit limited torsional distortion of the fin relative to said predetermined angular position under the influence of lateral aerodynamic forces for missile flight angles of attack within a preselected range; and

a hinge pin mounted on said fixture;

the fin being folded in against the fixture before launch and being directed outward after launch, said key-shaped portions being received by said fin notches and thereby locking said fin into position for limited torsional distortion.

6. The tail fin assembly as defined in claim 1 wherein said notches are shaped by milling a wedge-shaped portion of material from opposite sides of said notch.

4,588,146

BIAXIAL FOLDING LEVER WING

John A. Schaeffel, Jr., Cullman; Jimmy M. Madderra, and Ronald L. West, both of Huntsville, all of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 29, 1984, Ser. No. 594,658

Int. Cl.[4] F42B *13/32*

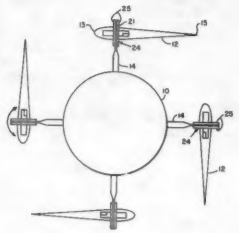
U.S. Cl. 244—3.27 **5 Claims**

1. A biaxial folding lever wing assembly including a plurality of wings each having a cavity therein and disposed for folded relation on a missile body prior to launch of the missile and for extended relation from said missile body responsive to launch thereof comprising:

a. swivel means coacting with the body of said missile and said wings so that the plane containing the semi-spans and chord of said wing is rotated from a second folded position parallel to the centerline of said missile body to a first folded position parallel to the centerline of said missile body, said first position being defined as a position wherein said chord of said wing is normal to the centerline of said body and the leading edge of said wing is adjacent said body;

b. first biasing means for extending said wings so that the semi-spans of said wings are normal to said body of said missile; and,

c. said swivel means including a plurality of wing root members secured to said body and extending therefrom and a swivel assembly rotatably secured to said wing root members, said swivel assembly and said wing root members disposed for positioning into said wing cavity responsive to deployment to said extended position, said swivel assembly including a flat end member having a shaft extending therefrom, said flat end member disposed for the rotatably secured relation with said wing root members, said swivel assembly further including a centerguide member rotatably secured to said shaft for rotation thereon, and second biasing means carried on said shaft for rotating said flat end member and said wing from said second position to said first position; and, wherein said centerguide member including a shoulder having a first pair of members extending therefrom, one of said first pair of members provided with a stop for engaging said flat end member when said wings are in said first position.



4,588,147

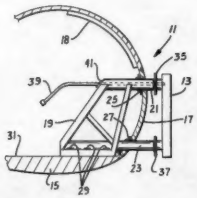
METHOD AND APPARATUS FOR SECURING PAYLOADS TO THE EXTERIOR OF AN AIRCRAFT

Thomas J. Lindsey, Jr., Marietta, Ga., assignor to Lockheed Corporation, Burbank, Calif.

Filed Jun. 11, 1984, Ser. No. 619,111

Int. Cl.[4] B64C *7/00, 1/14*

U.S. Cl. 244—118.1 **8 Claims**



1. An apparatus for securing a payload, the operation of which is controlled from the interior of an aircraft, to the exterior of the aircraft having an existing. removable pressure plug in the fuselage of the aircraft and a floor with tiedown rings adjacent the plug, said apparatus comprising:

(a) a modified pressure plug for replacing the existing, removable pressure plug in the fuselage of the aircraft, said modified pressure plug having at least one aperture therethrough;

(b) a load-bearing, structural support having at least one

support arm adapted to extend through the aperture of said modified pressure plug and a base adapted for attachment to the cargo floor, tiedown rings;

(c) a seal for sealing the aperture of said modified pressure plug when said support arm extends therethrough so as to provide a seal for pressurization loads resulting from the pressurization of the interior of the aircraft;

(d) an attachment point on said support arm adapted for attaching the payload to said support arm;

(e) a functional control connection means for connecting the external payload to the interior of the aircraft to facilitate the operation of the payload from the interior of the aircraft, said functional control connection means passing through said at least one support arm of said load-bearing, structural support.

4,588,148

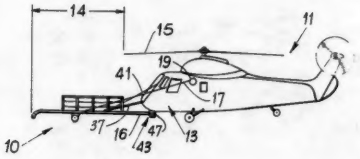
HELICOPTER RESCUE DEVICE

Walter Krauchick, 28 Humphrey St., Seymour, Conn. 06483

Filed Jun. 4, 1984, Ser. No. 616,904

Int. Cl.[4] A62B *1/02*; B64D *9/00*

U.S. Cl. 244—137 P **11 Claims**



1. An air rescue attachment device for a helicopter having a frontal passageway, comprising:

support means having a first and a second pair of anchor plates each affixed to the underside of the helicopter and a pair of support cables each affixed at one end to a respective upper side portion of the helicopter, said first pair of anchor plates are spaced apart and have a coaxial mounting bolt receiving hole, said second pair of anchor plates are spaced apart and have a coaxial mounting bolt receiving hole; and

platform means for supporting one or more traversing persons and being mountable to said support means with a first portion substantially in proximity to the frontal passageway to enable egress therebetween, said platform means having a predetermined length with a second portion extending outwardly from the helicopter a distance greater than the helicopter rotor blade rotational projection beyond the front fuselage to enable juxtapositioning of said end portion with a structure with said helicopter and platform means being airborne.

4,588,149

LOWERED OPENING SHOCK PARACHUTE CANOPY

David Gold, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 20, 1984, Ser. No. 652,548

Int. Cl.[4] B64D *17/18*

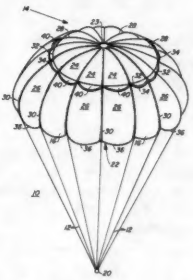
U.S. Cl. 244—145 **4 Claims**

1. In a circular parachute having a canopy with a conventional, inverted bowl shape with an apex opening and a plurality of suspension lines attached to said circular canopy about the circumference thereof for supporting a load therefrom, an improved canopy facilitating a soft opening action when deployed at high airspeeds, said canopy including:

a plurality of identical gores constructed of conventional parachute material, and each gore joined to adjacent gores to form said circular canopy, each gore characterized by being formed by an upper panel and a lower panel;

said upper panels joined to adjacent upper panels and being generally shaped as isoceles triangles extending from said apex opening to a predetermined point part way toward the attachment point of said suspension lines to an upper hem; and

said lower panels completing each gore being joined to adjacent lower panels to form a skirt portion of said canopy having a lower hem adjacent to said upper hem, each of said lower panels being shaped and dimensioned such that said lower hem is longer in circumference than said upper hem, each of said lower panels being joined to said upper panels along said hem lines and at points where they



are joined to adjacent panels such that the longer dimension of said lower hem is unattached between points of upper and lower panel junctions to form a cowl on each lower panel between points of attachment which collectively comprise an interupted circumferential vent extending about the canopy between the apex opening and the circumference where said suspension lines are attached, whereby said cowls are free to face inwardly under air pressure to fill said apex region during initial deployment and to face outwardly during final deployment to meet skirt air flow to effectively reduce opening shocks to a load attached to said suspension lines.

4,588,150

DOCKING DEVICE FOR SPACE VEHICLE

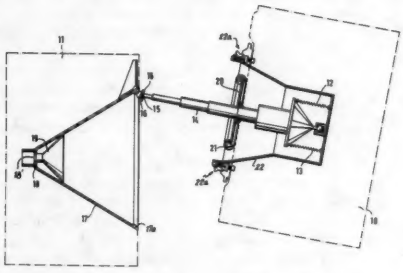
Jürgen Bock, Delmenhorst; Gerd Gloyer, Ganderkesee; Horst Richter, Delmenhorst, and Roland Felkei, Bremen, all of Fed. Rep. of Germany, assignors to ERNO-Raumfahrttechnik GmbH, Bremen, Fed. Rep. of Germany

Filed Apr. 20, 1983, Ser. No. 486,988

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1982, 3215229

Int. Cl.[4] B64G *1/64*

U.S. Cl. 244—161 **5 Claims**



1. A docking and coupling structure connected to and asso-

ciated with two space vehicles and respectively including first and second coupling devices comprising:

said first device including a telescopic rod means carrying a head, there being retractable and protractable latch elements provided in said head;

sensor means on said head;

a platform mounted to the respective vehicle by means of a plurality of springs being eccentrically mounted to the platform and together supporting said telescopic rod means being mounted centrally on said platform permitting a resilient deflection of the axis of the telescopic rod means from a center axis defined with respective said vehicle having said first device;

active control means for pivoting said telescopic mast for as to alter its direction, independently from any passive deflection on account of the plural springs;

said second device including a coupling funnel having a bottom and bottom opening constructed as latch trap for receiving said head and said coupling and latch elements;

means in the bottom opening of the funnel for cooperation with the sensor means such that the sensor means can locate the bottom opening; and

an annular buffering and cushioning means on said telescopic rod means for centering and limiting insertion in said funnel upon docking.

4,588,151

SOLAR RAY COLLECTOR FOR SPACECRAFT

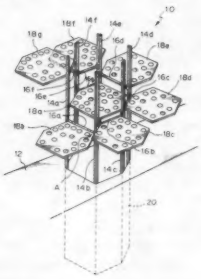
Kei Mori, 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan

Filed Jul. 12, 1984, Ser. No. 630,036

Claims priority, application Japan, Sep. 16, 1983, 58-171781

Int. Cl.[4] B64G *1/10*

U.S. Cl. 244—173 **3 Claims**



1. A solar ray collector adapted to be used for a spacecraft, comprising:

support means connected to the spacecraft, said supporting means being extended outside the spacecraft in use, said supporting means being formed of at least three posts arranged parallel to each other so that the distance between each adjacent two posts is equal to each other,

a plurality of holding means connected to and moved along the supporting means, each holding means having an axis and being rotatable relative to the axis, each holding means being in the form of a shaft situated between a respective adjacent two of the posts and extending perpendicular to the posts, and

a plurality of collector means each connected to a respective holding means so that the collector means are independently movable and rotatable relative to the supporting means, each collector means having a light receiving surface to receive solar rays thereon, the light receiving surface being of a configuration substantially corresponding to an area perpendicular to and surrounded by the posts, said shaft being movable along and rotatable relative to the posts so that when the collector means are not used, the collector means are held in an area surrounded by the posts, and when the collector means are used, the collector means are located substantially outside the area surrounded by the posts.

4,588,152

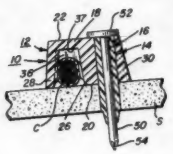
STUCCO WALL FASTENER

William E. Ruehl, Wheeling, and Joseph P. DeMarco, Park Ridge, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed Mar. 16, 1984, Ser. No. 590,306

Int. Cl.[4] F16L *3/04*

U.S. Cl. 248—71 **2 Claims**



1. A wire clamping clip for mounting on a stucco wall comprising a block member having a workpiece engaging surface and an exposed top surface, a recess formed in the workpiece engaging surface completely traversing said surface in a predetermined direction for receiving a wire, a throughbore formed in said block adjacent to said recess and in a normal relation therewith, a plastic bushing having a cross sectional dimension of the same shape and and slightly smaller than the cross sectional dimension of said throughbore and having a tapered nose portion at its lower end, said throughbore has a polygonal cross section and the exterior of said bushing has a conforming polygonal cross sectional shape to prevent rotational movement of said block member about said bushing, the length of said bushing being substantially longer than said throughbore, and a haredened pin with a sharpened end slidingly received in a tight frictional engagement through the center of said plastic bushing with an enlarged head for abutting against the top end of said bushing and having a length longer than said bushing so that its sharpened end extends beyond the lower end of said bushing.

4,588,153

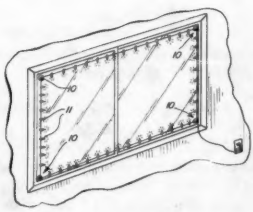
WIRE HOLDER

Edward P. Boston, 109 N. Evans Lawn, Aurora, Ill. 60506, and Robert L. Gibson, 1818 W. Greenleaf Ave., Chicago, Ill. 60626

Filed Oct. 18, 1984, Ser. No. 663,082

Int. Cl.[4] F16L *3/08*

U.S. Cl. 248—74.2 **1 Claim**



1. A wire holder for supporting one or more wires on the glass of a window to enable achievement of a desired lighting effect of Christmas lights by the use of a plurality of wire holders comprising, an attaching base of molded flexible material having a suction cup shape for holding to the glass by differential pressure and a wire mount of the same material and

integral with said attaching base, said wire mount being generally cylindrical and having two pairs of flexible legs defining a pair of slits extending transversely to each other and opening to an exposed end of the wire mount for each receiving a length of wire extending lengthwise of one of said slits, said slits each having a width less than the diameter of the wire lengths and a circular recess at the bottom thereof equal in diameter to the wire lengths to receive a wire length whereby the wire lengths may be forcibly moved along the slits to the recesses by spreading the pairs of flexible legs to increase the width of the slits and the wire lengths are held in the recesses by the flexible legs returning to their normal position and the slits returning to their normal widths, said slits being of differing heights to have the circular recesses at differing heights and spaced apart a distance greater than the diameter of the wire to be held whereby one length of wire positioned in a circular recess can overlie another length of wire positioned in the other of said circular recesses, and said flexible legs having a slight taper at their exposed ends to facilitate entry of the wire lengths into said slits.

4,588,154

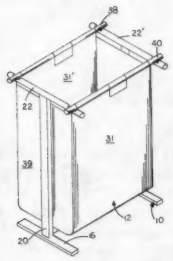
REMOVABLY-SUPPORTED HAMPER BAG AND SUPPORT FOR SAME

Wayne Basore, Cordova, Tenn., assignor to Worldsbest Industries, Inc., Memphis, Tenn.

Filed Oct. 4, 1984, Ser. No. 657,759

Int. Cl.[4] B65B *67/12*

U.S. Cl. 248—99 **3 Claims**



1. A hamper for storing laundry, and the like, comprising, in combination:

a supporting stand for supporting a hamper bag thereon, said supporting stand having a lower base portion and an upper bag-supporting portion;

bag means having a bag for storing therein laundry, and the like, said bag means further comprising means cooperating with said upper bag-supporting portion of said supporting stand for non-fixedly and removably mounting said bag means to said bag-supporting portion;

said cooperating means comprising a pair of spaced-apart rod members, said rod members passing through channels formed in the side portion of the upper lip of said bag means, each of said rod members having a length greater than the span of said upper lip of said bag means, so that the end of each rod member extends beyond said upper lip at the extremeties thereof from opposite ends of said upper lip to form protruding support end portions by which said bag means is supported on said upper bag-supporting portion of said supporting stand;

said lower base portion comprising a pair of parallel, upstanding posts at the upper ends of which said upper bag-supporting portion is mounted;

said upper bag-supporting portion of said supporting stand comprising a first horizontally-extending shaft and a second horizontally-extending shaft parallel to and spaced from said first shaft to define therebetween a hollow space, said hollow space extending downwardly toward said lower base portion, such that when said bag means is mounted to said supporting stand, said bag means occupies at least a portion of said hollow space, said first shaft being mounted to the upper end of one of said upstanding posts, and said second shaft being mounted to the other of said upstanding posts, such that the longitudinal axis of each of said first and second shafts extends perpendicularly to the vertical axis of its respective said upstanding post;

each of said rod members spanning the distance between said spaced-apart first and second shafts in a transverse direction such that said protruding support end portions of each of said rod members are supported by said first and second shafts, said first shaft supporting one said support end portion thereon, and said second shaft supporting the other end portion thereon, such that said rod members extend parallel to each other and spaced from each other along lengths of said first and second shafts;

each of said protruding support end portions of each of said rod members comprising a first groove means for receiving therein a mating portion of one of said first and second shafts, the distance between said first groove means of a respective one of said rod members being approximately equal to the transverse distance between said parallel and spaced-apart first and second shafts, so that said first groove means fits over corresponding mating portions of said first and second shafts;

each said mating portion of each of said first and second shafts comprising a second groove means for cooperating with one of said first groove means in said rod members, whereby said first and second groove means hold the bag to said supporting stand;

said bag being made of flexible material so that said upper lip thereof may be closed by drawing together said rod members toward each other, each of said first groove means of said rod members allowing said rod members to be drawn toward each other to close off said bag by riding along said first and second shafts until said rod members are in close proximity to each other thereby closing off said upper lip of said bag;

said upper lip of said bag comprising a pair of oppositely-disposed cut-out portions, one cut-out portion lying directly beneath the center portion of one of said rod members when said rod members are mounted in said upper lip, and the other cut-out portion lying directly below the center portion of the other rod member when said rod members are mounted in said upper lip, said cut-out portions constituting openings through which the fingers of a hand may extend for gripping said rod members when drawn together for closing off the upper lip, to thereby lift up said bag from said first and second shafts and carry the bag to a laundry room, or the like; and

each of said cut-out portions dividing the channel of its respective side portion of said upper lip into two channel sections, such that, when a respective one of said rod members is positioned in a channel on one side of said upper lip, the center portion thereof is exposed by the respective cut-out portion, said center portion lying between the adjacent ends of said two-channel sections of the respective side of said upper lip.

4,588,155

SUPPORTS FOR HOISTS

David R. James, Tirley, England, assignor to James Industries Limited, Gloucester, England

Filed Sep. 12, 1983, Ser. No. 531,911

Claims priority, application United Kingdom, Sep. 14, 1982, 8226132

Int. Cl.[4] A47H *1/10*

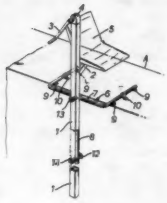
U.S. Cl. 248—205.1 **9 Claims**

1. A hydrotherapy hoist including an upstanding support column and a patient support member supported by said column, and a support structure by which the hoist is supported on the decking at the edge of a pool with the column extending

downwardly into the pool, wherein the support structure comprises:

an upper portion adapted to extend over the decking to support the vertical weight of the hoist on the decking, and adapted to engage an anchorage capable of withstanding horizontal loading at least in a direction towards the pool;

a lower portion having a reaction support for engagement with the side wall of the pool whereby the cantilever loading when a patient is supported on the hoist above the pool is withstood by a couple provided by the reaction to said horizontal loading applied to the anchorage and by the reaction force at said reaction support; and



support bearings for the upstanding support column which allow the latter to swing about a vertical axis offset from the longitudinal axis of the column between an operative position with the patient support member positioned above the pool to a loading position above the decking alongside the pool, said operative position and said loading position being displaced from one another by 180°, and wherein in the loading position the center of gravity of the hoist with a supported patient being positioned above said upper portion of the support structure so that the hoist is supported in a stable manner by the upper portion of the support structure resting on the decking.

4,588,156

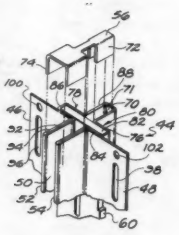
INTEGRAL BRACKET SUPPORT STRUCTURE

Jack Doke, Walnut, and Forrest E. Clemens, Sherman Oaks, both of Calif., assignors to Clemco Roll Forming, Inc., City of Industry, Calif.

Filed Jun. 15, 1984, Ser. No. 621,255

Int. Cl.[4] A47G *29/02*

U.S. Cl. 248—243 **2 Claims**



1. A bracket support structure comprising, in combination:

a. an elongated roll formed housing comprising a single integral structure including a laterally disposed channel for receiving a bracket support bar, an inwardly-projecting closed recess for accommodating the inner end of at least one wall bracket and an open, outwardly projecting passageway for laterally stabilizing said bracket; and

b. at least one clip for engaging an end of said housing, said clip including two opposed pairs of wings, said pairs of wings being arranged to provide outwardly-directed pressure upon the lateral walls of said closed recess and inwardly-directed pressure upon said outwardly-projecting passageway.

4,588,157

POST SUPPORT

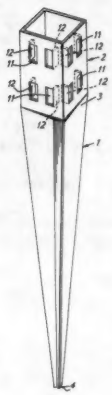
Derek J. Mills, South Glamorgan, Wales, assignor to Metpost Limited, Berkshire, England

Filed Mar. 14, 1984, Ser. No. 589,528

Claims priority, application United Kingdom, Mar. 14, 1983, 8307009; May 27, 1983, 8314836; Aug. 8, 1983, 8321322; Feb. 2, 1984, 8402848

Int. Cl.[4] F16M *13/00*

U.S. Cl. 248—545 **5 Claims**



1. A post support for a fence or building post, comprising an elongate ground engaging portion capable of being driven vertically into the ground, and a post engaging portion attached to the ground engaging portion and in the form of a hollow box section for receiving one end of a post to be supported in a vertical position and with its axis substantially parallel to the axis of the ground engaging portion, wherein:

the hollow box section is formed with means, integral therewith, other than means for adjusting the size of the box section for enabling an under-sized post to be rigidly supported in the box section;

said means for enabling an under-sized post to be rigidly supported in the box section comprises a first vertical projection extending inward from a wall of the box section to cut into the post as it is being driven into the box section;

said wall comprises a through opening including

(i) first and second horizontal edges extending through the wall, and

(ii) a vertical edge extending through the wall between first ends of the first and second horizontal edges; and

the first vertical projection is formed by bending inward a portion of the wall bounded by the first and second horizontal edges and said vertical edge.

4,588,158

SINGLE-PIECE INJECTION MOLDED RACK

Ravinder C. Mehra, Fairport, N.Y., assignor to Sybron Corporation, Rochester, N.Y.

Division of Ser. No. 550,574, Nov. 10, 1983. This application Aug. 26, 1985, Ser. No. 769,088

Int. Cl.[4] B29C *7/00*; B29F *1/14*

U.S. Cl. 249—64 **11 Claims**

1. An injection mold for the manufacture of a single-piece rack having top, bottom, and intermediate tiers selectively

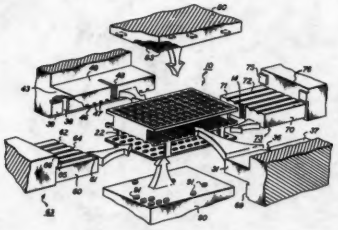
interconnected in spaced-apart superposed relation, said intermediate tier being a lattice defined by intersecting top and bottom sets of bars, the bars within each set being substantially parallel, said top set of bars being superposed over said bottom set of bars, said mold comprising:

an injection mold half and an ejection mold half, said ejection mold half being movable along a predetermined axial path relative to said injection mold half between a mold closed position and a mold open position, said ejection mold half cooperating with said injection mold half in the mold closed position to define a mold cavity corresponding to said rack, wherein:

said injection mold half includes a rear slide, a lower surface portion of said rear slide having parallel channels corresponding in cross-sectional dimensions to the cross-sectional dimensions of the top set of bars of said intermediate tier, said channels being aligned parallel to the axial path of movement of said ejection mold half; and wherein:

said ejection mold half includes:

a retainer block, said retainer block having a front slide, a lower surface portion of said front slide having parallel channels corresponding in cross-sectional dimensions to the cross-sectional dimensions of said top set of bars, said



channels being aligned parallel to the axial path of movement of said ejection mold half and cooperating in the mold closed position with the channels of the rear slide to define a first portion of the mold cavity corresponding to the top set of bars of the intermediate tier of said rack;

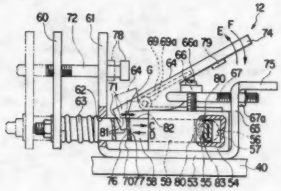
left and right core slides, said core slides being releasably retained within said retainer block and movable between a slide open position and a slide closed position, said slides being movable along predetermined coaxial paths in opposed directions relative to one another and at an angle relative to the path of movement of the ejection mold half, an upper surface portion of each of said left and right core slides including parallel channels corresponding in cross-sectional dimensions to the cross-sectional dimensions of said bottom set of bars, said channels being aligned parallel to the coaxial paths of movement of said core slides, the channels of the left core slide cooperating with the channels of the right core slide in the mold closed position to define a second portion of the mold cavity corresponding to the bottom set of bars of the intermediate tier of said rack, said second portion of the mold cavity cooperating with the first portion of the mold cavity to thereby define the portion of the mold cavity corresponding to the lattice of the intermediate tier of said rack.

4,588,159

PINCH VALVE DEVICE

Yoshio Kawai, Musashino, and Kiyoshi Kitagawa, Komae, both of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 30, 1983, Ser. No. 556,550
Claims priority, application Japan, Dec. 10, 1982, 57-216541
Int. Cl.[4] F16L *55/14*
U.S. Cl. 251—4 **9 Claims**



1. A pinch valve device comprising:

a nipping means having a pair of nipping portions adapted to be brought nearer to and apart from each other and to nip a resilient tube therebetween when brought nearer to each other to thereby close a passage in the tube, one of the nipping portion being in the form of a rod mounted in a pinch valve body, said rod being movable in a longitudinal direction of the rod so as to be brought nearer to and apart from the other of the nipping portions which is stationary and positioned in the valve body, the valve body having an aperture through which the resilient tube is inserted, the aperture extending perpendicularly to the moving direction of the movable nipping portion, said one nipping portion in the form of the rod having a nipping part at one end thereof facing the stationary nipping portion in the valve body and being connected at the other end thereof to a gripping mechanism adapted to displace the movable nipping part nearer to the stationary nipping portion, the gripping mechanism comprising a first gripping member fixed to the other end of the movable nipping portion and a second gripping member fixed to the valve body, the movable nipping portion passing substantially through the valve body, a spring means adapted to bias the movable nipping portion in a direction apart from the stationary nipping portion; and

a stop means adapted to stop said one of the nipping portions at a predetermined spacing as said nipping portions are biased apart from each other by the resilient repulsion of said resilient tube, said predetermined spacing being sized for allowing closure of the passage in the resilient tube when the nipping portions are brought nearer to each other than the predetermined spacing against the resilient repulsion of the resilient tube, the stop means having a first engaging part integrally formed with said one nipping portion, and a second engaging part connected to the other nipping portion and adapted to be engaged with the first engaging part so as to prevent said one nipping portion from being moved apart from the other nipping portion beyond said predetermined spacing, when the pair of the nipping portions are brought nearer to each other than the predetermined spacing;

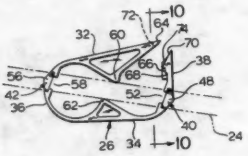
wherein the first engaging part includes a hole formed at an intermediate part of the movable nipping portion, and the second engaging part includes a hooked part formed at one end of a lever which is pivotably connected to the valve body at an intermediate position thereof, the lever being biased by a second spring means so that the hooked part may be forced to the intermediate part of the movable nipping portion.

4,588,160

TUBE CLAMPING DEVICE

Daniel P. Flynn, St. Louis, and Alan B. Ranford, Creve Coeur, both of Mo., assignors to Sherwood Medical Company, St. Louis, Mo.

Filed Mar. 27, 1985, Ser. No. 716,307
Int. Cl.[4] F16L *55/14*
U.S. Cl. 251—10 **5 Claims**



1. A tube clamping device for collapsible resilient tubing comprising a pair of arms each having one end connected to one end of the other arm, means resiliently biasing the opposite ends of the arms apart, means for latching said opposite ends together against the force of said biasing means to close the clamp, a first slot adjacent one end of the device extending inwardly from a side thereof and adapted to receive a portion of the tubing sidewall first, a second slot adjacent the opposite end of the device extending inwarly from a side thereof for receiving another portion of the tubing sidewall first, a pair of abutment means respectively disposed on said arms for clamping the opposed sides of the tubing toward each other to occlude the lumen of the tubing when the tubing portions are in said slots and said opposite ends of said arms are latched together, and arm alignment maintaining means including means for limiting relative lateral movement between the said opposite ends of said arms when said opposite ends of the arms are latched, said alignment maintaining means including a groove on said opposite end of one of said arms and a bar on said opposite end of the other of said arms adapted to enter said groove when the clamping device is closed whereby the sidewalls of said groove limit relative lateral movement between said arms, said latching means including at least one notch on said other arm adjacent said opposite end thereof and an end portion of said one arm adapted to enter said notch, said groove being disposed in said end portion so that parts of said end portion are on opposite sides of said groove and are insertable into said notch, said notch extending on opposite sides of said bar.

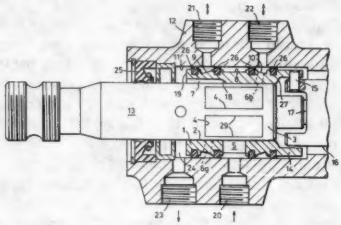
4,588,161

ROTARY VALVE AND A METHOD OF FORMING A SLEEVE FOR SUCH A VALVE

Frederick J. Adams, Clevedon, England, assignor to TRW Cam Gears Limited, Hertfordshire, Great Britain

Filed Jul. 9, 1984, Ser. No. 629,214
Claims priority, application United Kingdom, Aug. 5, 1983, 8321219
Int. Cl.[4] F16K *31/12, 5/00*
U.S. Cl. 251—31 **33 Claims**

1. A rotary valve for control of fluid to power assistance means of a steering gear which valve comprises a one piece sleeve having a cylindrical axial bore; first port means for connection to fluid pressure supply; second port means for connection to the power assistance means; third port means for connection to exhaust/reservoir; a rotor mounted in said bore, the rotor having fluid distributing zones displacement of which during relative rotation between the rotor and sleeve determines fluid flow between the port means to control actuation of the power assistance means, and wherein at least one said port means comprises axially extending slot means formed in the cylindrical bore of the sleeve, one end of said slot means



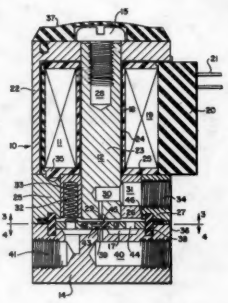
terminating within the bore and the other end opening into a radially extending end face of the sleeve.

4,588,162

SOLENOID VALVE

Allen J. Moffat, Wilmington, Ohio, assignor to Airmatic-Allied, Inc., Wilmington, Ohio

Filed Jun. 14, 1984, Ser. No. 620,507
Int. Cl.[4] F16K *31/06*
U.S. Cl. 251—129.16 **14 Claims**



8. An improvement for a solenoid valve having an axially extending magnetic pole piece with a valve opening in one end thereof, a coil surrounding the pole piece, a magnetic outer ring connected to the pole piece by means of a non-magnetic connecting ring, a magnetic housing magnetically connecting the other end of the pole piece to the outer ring and a fluid port for the valve opening, the improvement comprising the non-magnetic connecting ring radially surrounding the one end of the magnetic pole piece, the magnetic outer ring radially surrounding the non-magnetic connecting ring, the fluid port being located in the magnetic outer ring and the addition of a fluid passage extending through the non-magnetic connecting ring joining the valve opening to the fluid port.

4,588,163

VALVE STEM TRAVEL LIMITING APPARATUS

Norman B. Christensen, Sarasota, Fla., assignor to Dana Corporation, Toledo, Ohio

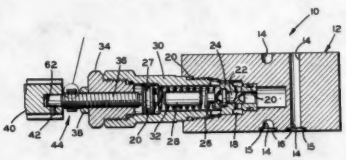
Filed Mar. 10, 1983, Ser. No. 474,007
Int. Cl.[4] F16K *51/00*
U.S. Cl. 251—285 **4 Claims**

1. In a pressure control valve assembly including a valve housing, a lock nut secured to said housing, an externally threaded valve stem extending through said lock nut, said stem being axially and rotatably movable relative to said lock nut; an improvement comprising a tamper-proof apparatus for limiting

axial travel of said externally threaded valve stem, said apparatus comprising:

(a) an internally threaded annular collar positioned over said externally threaded stem, said collar defining an axially extending unthreaded external surface parallel to said valve stem, said collar comprising a gap in the annular body thereof;

(b) a yieldable locking ring positioned over said collar, said



ring defining an axially extending unthreaded continuous internal surface parallel to said valve stem, said surface sized to form an interference fit with said external surface of said collar, said ring exerting sufficient force over said collar to close said gap, and to force said threaded portions of said stem and collar into distortion, said locking ring comprising a non-heat treated soft steel; and

(c) said apparatus being axially and rotatably movable with respect to said lock nut of said control valve assembly.

4,588,164

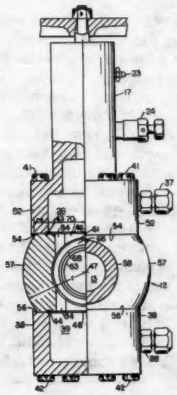
THROUGH CONDUIT GATE VALVE

Willard E. Kemp, 1035 Dairy Ashford Rd., Suite 249, Houston, Tex. 77079

Filed May 11, 1983, Ser. No. 493,589

Int. Cl.[4] F16K *3/316, 27/04*

U.S. Cl. 251—327 **30 Claims**



1. In a through-conduit gate valve having a body containing a cylindrical flow passage extending therethrough between end parts for connecting said valve into a piping system;

a transverse chamber through said body extending across said flow passage, and said chamber housing a gate moved transversely across said flow passage between open and closed positions, first and second closure members releaseably secured on annular seal surfaces to said body for enclosing said chamber;

an elongated gate having parallel sides and edges with a substantially rectangular cross section, and said gate having in longitudinal spaced relationship an imperforate portion and a perforate portion with an opening conforming to said flow passage;

said body carrying removable annular seats releaseably mounted in annular recesses about said flow passage and said seats engaging fluid tightly the parallel sides of said gate in its open and closed positions:

gate guide means in said body for controlling transverse and lateral movement of said gate between open and closed positions;

one of said closure members receiving said imperforate portion of said gate when in its open position;

the improvement comprising:

(a) said body having unitary gate guide means wherein said transverse chamber has a symmetrical oblong cross section defined by parallel sides facing the sides of said gate and rounded ends adjacent to the edges of said gate;

(b) transverse gooves extending inwardly into said body from said transverse chamber and between said parallel sides and said rounded ends; and

(c) said transverse grooves within said rounded ends providing parallel strip guide surfaces for engaging the edges of said gate during its movement between opened and closed positions.

4,588,165

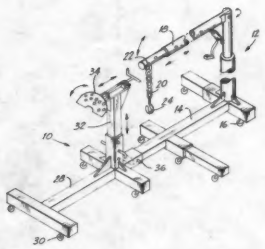
ENGINE STAND AND CRANE

Antonio J. Stellato, and George Spector, both of 233 Broadway; Rm 3615, New York, N.Y. 10007

Filed Dec. 20, 1984, Ser. No. 684,373

Int. Cl.[4] B66F *3/00*

U.S. Cl. 254—8 B **1 Claim**



1. A combination engine stand and engine puller crane wherein said engine puller crane comprises:

(a) an H-shaped base frame;

(b) a plurality of casters mounted to underside of said base frame making said base frame mobile so that said base frame can roll easily along a flat surface;

(c) an inverted L-shaped adjustable boom assembly mounted to one side of said base frame; and

(d) a hoist chain having a crane hook at one end, said hoist chain affixed to the free end of said boom assembly whereby said crane hook can hoist an engine from a motor vehicle, wherein said engine stand comprises:

(a) an adjustable vertical support bar mounted to one side of said base frame; and

(b) a swivel plate engine mounting head horizontally rotatably affixed to said support bar to secure said engine that is supported by said crane hook of said engine puller crane, wherein said base frame of said engine puller frame removeably interlocks with said base frame of said engine stand allowing one person to remove said engine from said motor vehicle using said engine puller crane and securing said engine to said engine stand, wherein said engine further comprises:

(a) said adjustable vertical support bar having an inverted cone shaped portion with a circular bearing race, mounted at the top end thereof;

(b) said swivel plate engine mounting head having circular

platform with an integral annular cam formed on the underside;

(c) a shaft mounted to the center underside of said circular platform so that said circular platform can rotate around a vertical axis on said circular bearing race; and

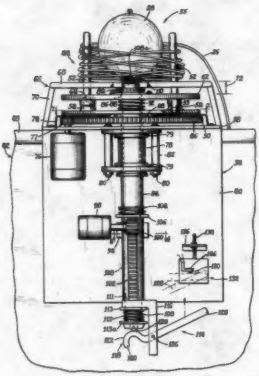
(d) a vertical locking bar spring biased upward and slideably mounted to said vertical support bar, said locking bar in engagement with said cam so that when said platform rotates out of proper alignment said cam will push said locking bar downward into said base frame, having an aperture, of said engine stand and said base frame, having an aperture, of said engine puller crane preventing removal therefrom.

4,588,166

TRAP HAULER AND EJECTOR

Ernest Cloud, 2846 Old Mayport Rd., Atlantis Beach, Fla. 32233

Filed Feb. 6, 1984, Ser. No. 577,019
Int. Cl.[4] B65H *51/00*; B66D *1/08*
U.S. Cl. 254—266 **9 Claims**



1. A trap line hauler and ejector device having a main axis, comprising,

a frame adapted for mounting the device on a boat with said axis adjacent the vertical,

a winch including a spindle plate and a plurality of pins mounted at one end thereon with their other and extended ends free and detached, said winch being mounted on the frame for rotation about said axis, with the spindle plate disposed lowermost and the pins extending upwardly therefrom and arranged in a single circle around said axis,

the pins forming the core of the winch and constituting the entire winch throughout their own length and other than the spindle plate,

an ejection plate slidable on said pins, having a normal lower position adjacent the spindle plate,

the pins being spaced apart and forming a basket therebetween for holding a buoy having a rope attached thereto, said pins winding said rope therearound in response to rotation of the winch and feeding of the rope transaxially throughout a range extending the greater part of the length of the pins, whereby the rope forms a coil on the pins and the pins are capable of receiving and holding such a coil thereon throughout said greater part of the length of the pins,

means for rotating the winch, and

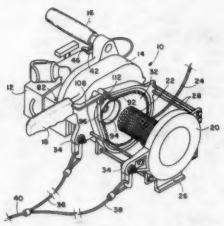
means for moving the ejection plate axially toward the extended ends of the pins for ejecting said buoy and said coil of rope off of the pins and thereby from the winch.

4,588,167

PORTABLE POWER DRIVEN WINCH

Jack E. Finzel, Milwaukie, Oreg., assignor to Portable Power Tools, Inc., Portland, Oreg.

Filed Aug. 9, 1984, Ser. No. 639,924
Int. Cl.[4] B66D *1/14, 5/10*
U.S. Cl. 254—346 **7 Claims**



1. A portable winch, comprising:

(a) a gearcase having opposite first and second ends, opposite front and rear sides, and a final driven shaft extending from said first end;

(b) a spool-supporting frame extending from said first end;

(c) a spool carried on said frame and defining a spool axis of rotation extending directly toward said gearcase;

(d) an engine fixedly attached to said second end of said gearcase;

(e) a first winch-supporting handle extending from said second end of said gearcase and located above said engine and forward of and generally parallel with said spool axis of rotation;

(f) a second winch-supporting handle extending generally perpendicular to and rearwardly from said rear side of said gearcase;

(g) a throttle control lever mounted on said second end of said gearcase and rotatable about a throttle control lever axis extending substantially parallel with said first handle;

(h) a finger contact bar attached fixedly to said throttle control lever, extending generally parallel with and located below said first handle and spaced apart therefrom, but within reach of a hand holding said first handle, and moveable toward said first handle so as to rotate said throttle control lever about said throttle control lever axis;

(i) means connecting said throttle control lever to said engine for accelerating said engine in response to movement of said finger contact bar toward said first handle;

(j) a brake drum mounted on said final driven shaft;

(k) a brake band encircling said brake drum; and

(l) brake lever means pivotably mounted on said first end of said gearcase and extending rearwardly alongside said second handle, within reach of a finger of a hand while said hand holds said second handle, for selectively tightening said brake band about said brake drum.

4,588,168

DEVICE FOR REGULATING THE DELIVERY OF HOT AIR IN A TUYERE STOCK OF A SHAFT FURNACE AND A TUYERE STOCK WHICH INCORPORATES THE SAME

Pierre Mailliet, Howald; Gilbert Bernard, Helmdange, and Marc Calmes, Luxembourg, all of Luxembourg, assignors to Paul Wurth S.A., Luxembourg

Filed Nov. 7, 1984, Ser. No. 669,257
Claims priority, application Luxembourg, Nov. 7, 1983, 85079
Int. Cl.[4] C21B *7/16*
U.S. Cl. 266—81 **45 Claims**

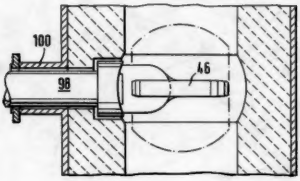
1. An apparatus for regulating the delivery of air in a tuyere stock of a shaft furnace, the tuyere stock including an articulated pipe section connected at a first end to an annular conduit and at a second end to a nozzle, at least a portion of the tuyere stock being lined with a refractory material having an internal

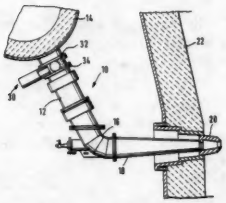
channel therethrough for the passage of air, the regulating appartus comprising:

valve means;

rod means having a longitudinal axis, said valve means being mounted on a first end of said rod means, said valve means and said first end of said rod means adapted for being disposed internally of said tuyere stock;

cylindrical support means, said cylindrical support means being adapted to attach to a portion of said tuyere stock, said rod means being rotatatably and hermetically mounted in said cylindrical support means;





means external of said tuyere stock for pivoting said rod means and said valve means about said longitudinal axis wherein said delivery of hot air is varied in said tuyere stock between an open and closed position;

wherein said first end of said rod means includes;

a cylindrical cheek; and

wherein said valve means includes;

a cylindrical sleeve, said cylindrical cheek and cylindrical sleeve having complimentary adjacent surfaces; and

means for selectively maintaining contact between said complimentary adjacent surfaces.

4,588,169

ARRANGEMENT TO BE USED WITH A TILTABLE METALLURGICAL VESSEL

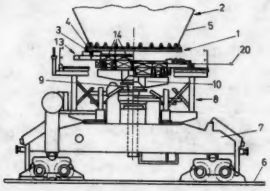
Manfred Eysn, Puchenau; Viktor Ducai, Linz, and Kurt Hohmann, Ybbs, all of Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Sep. 14, 1984, Ser. No. 650,901

Claims priority, application Austria, Sep. 28, 1983, 3437/83

Int. Cl.[4] C21B *7/08*

U.S. Cl. 266—165 **6 Claims**



1. In an arrangement for installing and removing the mouth ring of a tiltable metallurgical vessel, such as a steel works converter, in which the mouth ring is comprised of a plurality of mouth ring segments releasably secured to the vessel around its mouth, and wherein said vessel is tilted in its upside-down position with the mouth ring facing downward during installation and removal of the mouth ring segments, the improvement which comprises,

a car displaceable into position below the mouth of said vessel with said vessel in the upside-down position,

a platform provided on said car,

at least one support means on said platform, said support means having an upper side for holding a mouth ring segment,

means for displacing and pivoting said at least one support means to align said support means with the position of a selected mouth ring segment on said vessel, and

means for lifting and lowering said platform, with said car below the mouth of said vessel, to position said at least one support means at a level at which said upper side would be nearly in contact with the lower surface of a mouth ring segment on said vessel, thereby enabling a mouth ring segment carried by said support means to be secured to said vessel or said support means to receive a mouth ring segment released from said vessel.

4,588,170

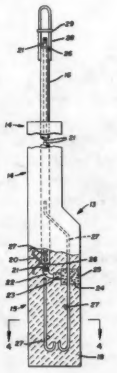
SIDE MOUNTED LANCE FOR LADLES

Jeffrey A. Towns, New Waterford, Ohio, assignor to Insul Company, Inc., East Palestine, Ohio

Filed Sep. 6, 1985, Ser. No. 773,237

Int. Cl.[4] C21C *5/32*

U.S. Cl. 266—225 **7 Claims**



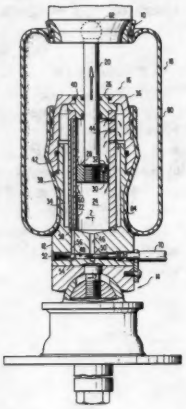
1. Apparatus for bubbling gas into molten metal in a ladle having a protective refractory lining on the bottom and side walls thereon, said apparatus comprising a lance consisting of an elongated refractory body member of a configuration registering with a vertical groove in the refractory lining in the side wall of said ladle, at least one tubular member positioned axially of said elongated body member and extending outwardly of one end thereof and communicating with at least one opening in said elongated body member inwardly of the opposite end thereof, said opening facing the interior of said ladle and means for introducing gas into said tubular member.

4,588,171

SHOCK ABSORBER AND AIR SPRING ASSEMBLY

Robert K. Stephens, Brookfield, Wis., assignor to Applied Power Inc., Milwaukee, Wis.

Filed Dec. 18, 1981, Ser. No. 332,189
Int. Cl.[4] F16F 9/04
U.S. Cl. 267—64.24 7 Claims



1. An integral shock absorber and spring assembly for remotely adjusting the amount of damping on a down stroke of the shock absorber comprising:

(a) a first base;

(b) a rod projecting from said first base;

(c) a second base;

(d) a cylinder projecting from said second base, said cylinder containing a first bore having a first end and a second end, the first end being closed by a cap through which said rod slidingly projects;

(e) a piston carried by said rod within said first bore;

(f) a reservoir for hydraulic fluid;

(g) a first path of fluid communication from the first end of said first bore to said reservoir;

(h) a second path of fluid communication from the second end of said first bore to the first end of said bore, said second path including,

a first longitudinal bore in said second base in communication with said first bore,

a radial bore in said second base in communication with said first longitudinal bore and said second base,

a remotely adjustable flow control valve within said radial bore in said second base,

a second longitudinal bore in said second base in communication with said radial bore,

a one-way valve contained in said second longitudinal bore which permits fluid

flow towards the first end of said first bore but prevents fluid flow in the opposite direction, and

a conduit in said cylinder in fluid communication between said second longitudinal bore in said second base and said first bore on the first side of said piston; and

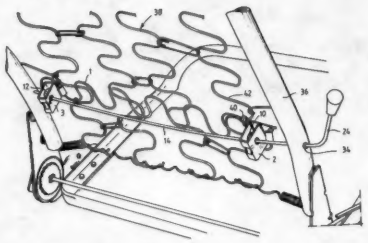
(i) a spring surrounding said rod and said cylinder and being connected at one end to said first base and at the other end to one of said second base or said cylinder.

4,588,172

DEVICE FOR LOCALLY ADJUSTING THE TENSION OF AN ELASTIC SHEET, IN PARTICULAR FOR A VEHICLE SEAT

Francois Fourrey, Montbeliard, and Patrice Ciciliani, Seloncourt, both of France, assignors to Cycles Peugeot, Valentigney, France

Filed Mar. 25, 1985, Ser. No. 715,843
Claims priority, application France, Mar. 27, 1984, 84 04762
Int. Cl.[4] F16F 3/00
U.S. Cl. 267—89 11 Claims



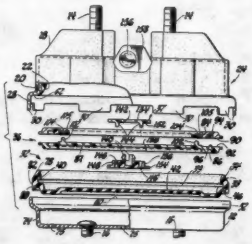
1. A device for locally adjusting the tension of an elastic sheet, in particular for a vehicle seat back, said device comprising a flat spring having two end portions, means defining two parallel surfaces respectively rigid with each of said end portions, two rotary discs enclosed between said respective parallel surfaces, the two discs being connected to rotate with each other but inclined in opposite directions so that their rotation pivots in opposite directions the parallel surfaces rigid with the two end portions of the spring and brings about a modification of the length and of the curvature of the spring.

4,588,173

HYDRAULIC-ELASTOMERIC MOUNT

Thomas P. Gold, West Carrollton, and Richard A. Muzechuk, Kettering, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 554,526, Nov. 23, 1983, abandoned. This application Jan. 7, 1985, Ser. No. 689,139
Int. Cl.[4] F16F 9/10
U.S. Cl. 267—140.1 14 Claims



1. A hydraulic-elastomeric mount comprising a pair of mounting members, a hollow elastomeric body interconnecting said mounting members, an elastomeric diaphragm configured so as to close said elastomeric body and form therewith a closed cavity that is filled with liquid, a partition dividing said cavity into a chamber enclosed by said elastomeric body and a chamber enclosed by said diaphragm characterized in that said partition comprises a partition plate that solely separates said chambers, an annular plate, said plates having mating faces formed so as to cooperatively define at least one orifice therebetween extending in a plane and along and adjacent the pe-

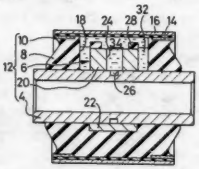
riphery of said plates, and each of said plates having an opening therethrough to one end only of said orifice so that said orifice interconnects said chambers.

4,588,174

FLUID-FILLED RESILIENT BUSHING

Keizo Konishi, c/o Tokai Rubber Industries, Ltd., 3600, Aza-Utazu, Oaza-Kitatoyama, Komaki-shi, Aichi-ken, Japan

Filed Oct. 12, 1983, Ser. No. 540,907
Claims priority, application Japan, Mar. 9, 1983, 58-39818
Int. Cl.[4] F16F *1/48*
U.S. Cl. 267—140.1 **10 Claims**



1. A fluid-filled resilient bushing wherein an annular resilient member is interposed under radial compression between an inner sleeve and an outer sleeve concentric with the inner sleeve, said annular resilient member having a plurality of mutually independent recesses interconnected through an orifice, said recesses cooperating with at least one of said outer and inner sleeves to define plural pockets which are filled with a predetermined non-compressible fluid, said orifice through which said fluid flows from one of said pockets to another providing a resistance to the fluid flow which gives a desired damping effect, said bushing comprising:

radial stop means formed by a hollow member which is made of a rigid material, said hollow member having a central bore and radially thick-walled portions, said inner sleeve being press-fitted in said central bore of the hollow member such that said thick-walled portions extend into said pockets from said inner sleeve toward said outer sleeve, said outer sleeve being brought into abutment on said thick-walled portions upon application of a high load to the bushing, thereby limiting deformation of said annular resilient member,

said orifice comprising a passage which is defined by an outer peripheral surface of said inner sleeve and an inner peripheral surface of said hollow member, and further comprising communicating holes which are formed radially of said hollow member through said thick-walled portions and are open at outer peripheral surfaces of said thick-walled portions, said communicating holes effecting communication between said passage and said pockets.

4,588,175

TORSION SPRING APPARATUS AND METHOD

David O. Martin, Salt Lake City, and Lawrence G. Martin, Bountiful, both of Utah, assignors to Martin Door Manufacturing, Salt Lake City, Utah

Continuation-in-part of Ser. No. 428,106, Sep. 29, 1982, abandoned. This application Oct. 12, 1984, Ser. No. 660,449
Int. Cl.[4] F16F *1/16*
U.S. Cl. 267—155 **7 Claims**

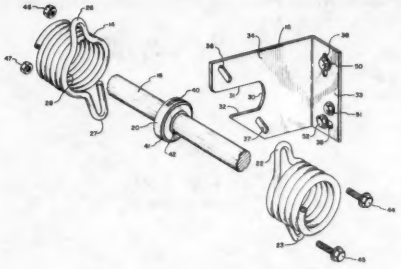
1. A torsion spring apparatus and mounting assembly comprising:

a bracket for mounting to a surface and comprising a slot;

a support rod;

bearing means on the support rod for mounting the support rod in the slot of the bracket in rotatable relationship to the bracket;

a torsion spring apparatus mounted over the support rod on each side of the bracket; and



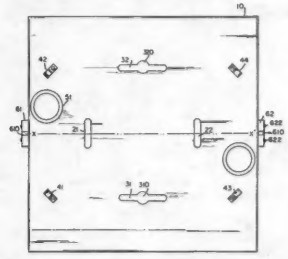
securement means on the torsion spring for mounting the torsion spring to the bracket comprising anchor loops formed in the adjacent end of the torsion spring.

4,588,176

SPLICE WORK TRAY ASSEMBLY

John J. Anderton, Oil City, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Continuation of Ser. No. 438,563, Nov. 3, 1982, Pat. No. 4,556,206. This application Nov. 14, 1984, Ser. No. 671,379
The portion of the term of this patent subsequent to Feb. 25, 2003, has been disclaimed.
Int. Cl.[4] B23Q *3/00*
U.S. Cl. 269—16 **3 Claims**



1. A work tray for consummating fiber optic splices between at least two fiber optic cables, said tray comprising:

a work surface defined by a perimeter, said work surface containing: a first pair of spaced apart, elongated slots having a relatively constant width;

a second pair of spaced apart, elongated slots, orthogonal to said first pair, said second pair of slots having end portions of a relatively constant, given width and central portions having a width larger than said given width;

a pair of fiber optic cable clamps affixed to said perimter and upstanding above said surface, said clamps being diametrically opposed and aligned with said first pair of slots; and

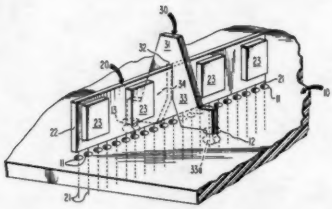
a plurality of flexible clips affixed to said surface, said clips being diagonally arrayed with respect to said first and second pairs of slots.

4,588,177

FASTENER FOR HOLDING SIPS ON PC BOARDS DURING SOLDERING

Paul K. White, Poway, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Mar. 22, 1985, Ser. No. 714,725
Int. Cl.[4] B25B *1/20*
U.S. Cl. 269—41 **11 Claims**



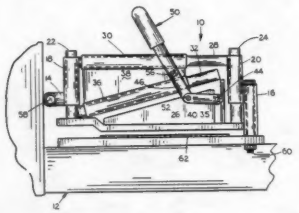
1. An electromechanical assembly comprising: a printed circuit board; a SIP having a set of input/output signal pins that are loosely fitted into a corresponding set of holes in said board; and a fastener for temporarily holding said SIP in said board as said pins are soldered in place; said fastener including a planar piece of unsolderable material having a body with a slot which is slipped over and holds said SIP; said planar piece of material further having a leg which extends from said body; and said leg having an end section which is parallel to said slot and is press fitted into an anchor hole that is perpendicular through said board to orient said slot and said SIP perpendicular to said board.

4,588,178

HOLD-DOWN DEVICE

Leonard Harrison, Clay Center, Kans., assignor to Center Engineering, Inc., Clay Center, Kans.

Filed Jun. 17, 1985, Ser. No. 745,436
Int. Cl.[4] B25B *1/08*
U.S. Cl. 269—234 **1 Claim**



1. A hold-down device, comprising,

first and second vertically disposed supports having upper and lower ends,

means for mounting said supports against vertical movement,

third and fourth supports vertically movably mounted in said first and second supports respectively,

a first horizontally disposed member secured to and extending between said first and second supports adjacent the upper ends thereof,

a substantially horizontally disposed hold-down shoe secured to and extending between the lower ends of said third and fourth supports,

a post means secured to said shoe, between said third and fourth supports and adjacent said fourth support, and extending upwardly therefrom, said post means having upper and lower ends, the upper end of said post means terminating below said first member,

a second angularly disposed elongated member having one end secured to the upper end of said post means and its other end secured to said third support below said first support,

a first tubular member slidably mounted on said first horizontally disposed member,

a second tubular member slidably mounted on said second angularly disposed elongated member,

rigid connection means connecting said first and second tubular members,

a first linkage means, having opposite ends, pivotally secured at one end to said post means below the upper end thereof,

a lever member having upper and lower ends,

said lever member being pivotally connected, about a horizontal axis, between its ends, to said rigid connection means,

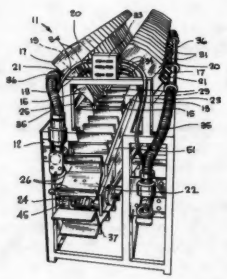
said lever member being pivotally connected at its lower end, about a horizontal axis, to the other end of said first linkage means whereby pivotal movement of said lever in one direction will cause said hold-down shoe to be moved downwardly relative to said first and second supports and whereby pivotal movement of said lever in a direction opposite to said one direction will cause said hold-down shoe to be moved upwardly relative to said first and second supports.

4,588,179

CARD COLLATOR WITH BOTTOM HOLE PNEUMATIC PULLER EXTRACTOR

Thomas Gutierrez, 266 N. Cypress St., San Jose, Calif. 95117

Filed Jan. 16, 1985, Ser. No. 692,290
Int. Cl.[4] B65H *39/02*
U.S. Cl. 270—58 **15 Claims**



1. A collator for cards comprising,

means for supporting a stack of flexible cards in a manner such that the bottom of the stack is at least partially accessible,

a pair of opposed chutes, each with an associated means for supporting a stack of flexible cards, each chute having a lower end and an upper end, each upper end near an associated stack of cards, each chute mounted in spaced relation relative to the bottom of the stack, each chute defining a hole therein below the card stack,

a pair of opposed movable pneumatic pullers comprising low pressure tubes, each puller extendable through said hole in an associated chute for contacting the bottommost card in a card stack, the dimensions of each hole being less than the dimensions of a card whereby a hole stops a card when a puller is retracted through the hold,

reciprocating arm means for moving opposed pullers into and out of contact with the accessible bottom of an associ-

ated stack of cards through respective holes in said associated chutes,

means for providing motion to said reciprocating arm means, and

bin means in card receiving relation relative to the lower end of each chute, said bin means having associated indexing means for indexing said bin means a predetermined distance relative to said chutes.

4,588,180

LOADER FOR SIGNATURES, SHEETS AND SIMILAR PRODUCTS, FOR THE FEEDERS OF PACKAGING MACHINES, BOOKBINDING MACHINES AND THE LIKE

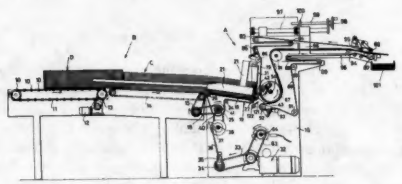
Aris Ballestrazzi, and Lamberto Tassi, both of Savignano sul Panaro, Italy, assignors to SITMA Societa Italiana Macchine Automatiche S.p.A., Spilamberto, Italy

Filed Apr. 2, 1985, Ser. No. 719,157

Claims priority, application Italy, Apr. 9, 1984, 20453 A/84

Int. Cl.⁴ B65H *5/22*

U.S. Cl. 271—5 **27 Claims**



1. A loader for signatures, sheets and similar products, for those feeders of packaging machine, bookbinding machines and the like which comprise a box-type magazine, characterised by comprising a product feed channel with a descending inclined base formed from at least one conveyor belt guided about a deviation roller at the lower end of the channel, and with lateral containing walls, the products being disposed in said channel transversely in a standing position and in mutual contact, a mechanism for controlling the stepwise advancement of said conveyor belt, a transverse counteracting plate spaced apart from the lower end of the feed channel and having its lower edge raised from the inclined surface of said conveyor belt so as to create a withdrawal zone for the products fed through said channel, a group of arms provided at their free ends with suckers arranged to be put into communication with a suction source, said arms being carried by a rockable transverse shaft, control means for imparting rocking movements to said shaft and for moving the suckers of said arms alternately into the withdrawal zone and into a position removed from said zone, a second transverse shaft parallel to said arm-carrying shaft, said second shaft carrying wheels offset with respect to said arms, gripper members mounted on said wheels and arranged to grip the products transferred by the sucker arms when these are in the position removed from the withdrawal zone, for each of said wheels a first endless belt guided about deviation and tensioning rollers and wrapped about said wheel through an arc of greater than 180°, and a second endless belt guided about deviation and tensioning rollers and wrapped about said wheel over said first belt through an arc of less than 180°, said two belts travelling together in mutual contact from the point in which the second belt wraps over the first on said wheel to a discharge point determined by respective deviation rollers which withdraw them from each other, and cooperating in order to convey the product inserted between them as far as said discharge point, motor means for rotating said second wheel-carrying shaft and for driving the pairs of belts wrapped about said wheels, a mechanism controlled by fixed cams for operating said gripper members during the rotation of the gripper-carrying wheels, feeler elements acting in the product withdrawal zone and mounted to swivel between a position in which they are in contact with the product abutting against said counteracting plate and a position removed from the withdrawal zone, means linked to the control means for said sucker arms in order to remove said feeler elements from the withdrawal zone when the sucker arms are moved into this zone, and to enable the feeler elements to be moved under the action of elastic means into contact with the product abutting against the counteracting plate when the sucker arms are removed from the withdrawal zone, and a switch operationally associated with said feeler elements and acting on said mechanism for controlling the stepwise advancement of the conveyor belt in the feed channel in order, at any given time, to halt the advancement through one step when the feeler elements in the product withdrawal zone detect a thrust determined by the products in the feed channel which exceeds a predetermined value.

4,588,181

DOUBLE-FEED PREVENTION DEVICE IN PAPER FEEDING APPARATUS

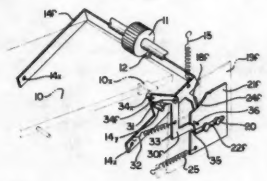
Kei Sakata, Wakayama; Kazunori Tanaka, Atsugi, and Kazunori Aiuchi, Kawasaki, all of Japan, assignors to Duplo Seizo Kabushiki Kaisha, Japan

Filed Mar. 16, 1984, Ser. No. 590,221

Claims priority, application Japan, Mar. 18, 1983, 58-44481

Int. Cl.⁴ B65H *3/52*

U.S. Cl. 271—121 **9 Claims**



1. A double-feed prevention device to feed single sheets of paper from a stack of paper sheets placed on a paper feeding plate including a paper feeding roller in opposition to a paper separating means provided at an end of a resiliently biased swingable lever means arranged to move the paper separating means against the paper feeding roller and being adapted for pivotal movement in a substantially vertical plane, comprising a locking means secured by guiding means to a stationary supporting means, said locking means being adapted to slideably move parallel to said swingable lever means plane of movement, said locking means having a part thereof to be engaged with a part of the swingable lever means to prevent the paper separating means from moving away from the paper feeding roller, said locking means being biased to slide in a direction such that said locking means part is urged into engagement with said swingable lever means part and moves in response to movement of said swingable lever means part.

4,588,182

PAPER FEEDING APPARATUS

Tomoyuki Nakanishi, Moriyama, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Apr. 6, 1984, Ser. No. 597,374

Claims priority, application Japan, Apr. 6, 1983, 58-51295[U]

Int. Cl.⁴ B65H *3/52*

U.S. Cl. 271—121 **3 Claims**

1. A paper feeding apparatus comprising:

a cassette box containing stacked papers;

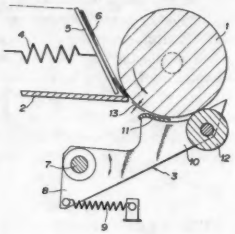
a feeding roller supported rotatably on a frame of a body for feeding one sheet of said stacked papers from said cassette box by surface friction;

a swinging arm supported pivotally on said frame of said body;

a guide element fixed on a surface of said swinging arm and in a position opposing to said feeding roller;

a guide roller supported rotatably on said swinging arm at a location spaced from said surface; and

means for biassing said swinging arm so that said guide roller



abuts against a peripheral surface of said feeding roller, the abutment of said guide roller against the surface of said feeding roller defining a positioning of said swinging arm to provide a fixed clearance between said feeding roller and said guide element which is maintained as said feeding roller wears.

4,588,183

SHEET FEEDING APPARATUS

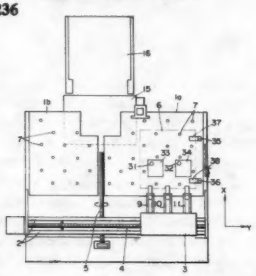
Hiroshi Kitano, Hiratsuka, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Japan

Filed Aug. 30, 1984, Ser. No. 645,623

Claims priority, application Japan, Sep. 2, 1983, 58-161755

Int. Cl.[4] B65H *9/10*

U.S. Cl. 271—236 **7 Claims**



1. In a sheet feeding apparatus having clamping means for clamping a rectangular material sheet placed on a table, and means for feeding said clamping means to a desired position, the improvement comprises:

sucking means for sucking said sheet,

transferring means for transferring said sheet sucked by said sucking means toward said clamping means along said table in a first direction and a second direction perpendicular to said first direction,

stopper means for engaging an edge of said sheet when the sheet is moved in said second direction,

transfer control means for controlling said transferring means such that the amounts of transfer in said first and second directions is enough to engage ends of said sheet with the end surface of said clamping means and said stop means,

sucking control means for controlling sucking force of said sucking means such that said sucking means is slidable on said sheet after said sheet is stopped.

4,588,184

METHOD OF FLOW-FEEDING SHEETS

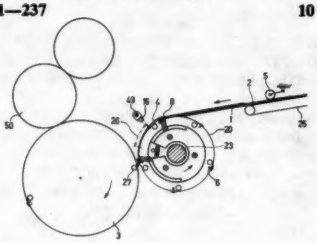
Willi Jeschke, Heidelberg, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Filed Mar. 26, 1984, Ser. No. 593,608

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1983, 3311196

Int. Cl.[4] B65H *9/00*

U.S. Cl. 271—237 **10 Claims**



1. Assembly for stream feeding sheets overlappingly staggered relative to one another via a feed table to an aligning device and for delivering the sheets aligned by the aligning device to a sheet-processing machine, the assembly continuously maintaining movement of the sheets in direction towards the sheet-processing machine during alignment of the sheets by the aligning device, comprising an aligning cylinder disposed under the feed table for receiving a sheet to be aligned which is fed thereto via the feed table, at least two rows of front lays disposed symmetrically on and around the circumference of said aligning cylinder, respective suction-pull bars likewise disposed on said aligning cylinder upstream of said rows of front lays as viewed in sheet travel direction, and drive means for said suction-pull bars disposed at one side on a side wall of the machine.

4,588,185

TRANSFER DEVICE OF SHEET OBJECT

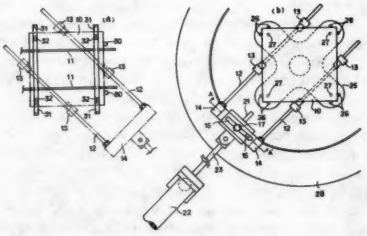
Mikio Shoda, Omi Hachiman; Masahiko Oka, and Masami Nishida, both of Hikone, all of Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed Dec. 21, 1983, Ser. No. 564,090

Claims priority, application Japan, Dec. 30, 1982, 57-231236

Int. Cl.[4] B65H *5/04, 29/44*

U.S. Cl. 271—267 **4 Claims**



1. A device for transferring sheet objects from an end position of a conveyor to a work position of a treatment apparatus, the device comprising:

two parallel transfer bars having a space therebetween;

a plurality of position adjustment pieces for holding the sheet object, including at least one position adjustment piece provided slideably on one of said transfer bars, and

at least two position adjustment pieces provided slideably on the other of said transfer bars, each of said adjustment pieces being independently adjustable along said transfer bars;

means for adjusting the space between said transfer bars; and

means for intermittently moving said transfer bars and said position adjustment pieces along with the sheet object from the end position to the work position.

4,588,186

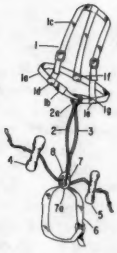
STRETCHING APPARATUS

John Calabrese, 1125 W. 26 St., Erie, Pa. 16508

Continuation-in-part of Ser. No. 497,274, May 31, 1983, Pat. No. 4,456,249. This application Jun. 25, 1984, Ser. No. 624,470

Int. Cl.[4] A63B *21/00*

U.S. Cl. 272—126 **2 Claims**



1. Self-contained stretching apparatus comprising shoulder harness having a first flexible strap loop fitting around the mid-chest region above the waist and under the arms, a first ring means connected directly to and slidably mounted on said first loop, two ropes, each rope having one end fixed to the first ring, a second flexible strap loop forming a foot receiving stirrup, a second ring means adjustably mounted on and forming a connection to said second loop, a right handgrip connected to the other end of one of said ropes, said one rope having its midsection running through said second ring means, a left handgrip connected to the other end of the other of said ropes, said other of said ropes having its midsection running through said second ring means whereby pulling on the handgrips regulates the tension in the ropes between said first and second loops.

4,588,187

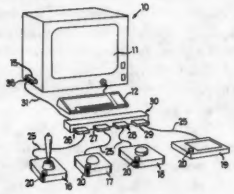
PORT EXPANSION ADAPTER FOR VIDEO GAME PORT

George H. Dell, Morton Grove, Ill., assignor to Wico Corporation, Niles, Ill.

Filed Jun. 27, 1984, Ser. No. 625,102

Int. Cl.[4] A63B *67/00*

U.S. Cl. 273—1 E **19 Claims**



1. An adapter circuit comprising a plurality of first ports and a second port, switching means connected to each of said first ports and to said second port, and control means connected to each of said first ports and to said switching means, said control means being responsive to a signal at any one of said first ports for causing said switching means to establish a connection between said one first port and said second port.

4,588,188

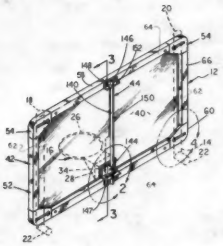
BACKBOARD REINFORCING APPARATUS

Kenneth J. Mahoney; Dana G. Rosenburg, and Thomas H. Mahoney, all of P.O. Box 6, all of Dorrance, Kans. 67634

Filed Oct. 15, 1984, Ser. No. 660,715

Int. Cl.[4] A63B *63/08*

U.S. Cl. 273—1.5 R **17 Claims**



1. A backboard reinforcing apparatus adapted to be suspended above a basketball playing surface and having a basketball goal assembly connected thereto, comprising:

(a) a main backboard member;

(b) a backboard and main support assembly to receive and support a main backboard member about its periphery;

(c) a transverse frame and goal support assembly secured between opposed portions of said backboard and main support assembly; and

(d) said frame and goal support assembly includes a lateral suport assembly to receive and support said basketball goal assembly thereon;

whereby forces applied against said basketball goal assembly during basketball play are transferred to said frame and goal support assembly and said backboard and main support asesmbly and not to said backboard member to prevent breakage thereof.

4,588,189

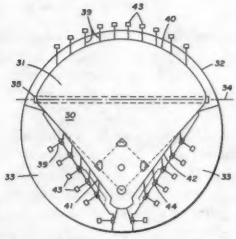
MANIPULATING LARGE SECTIONS OF ARTIFICIAL TURF

Kearney D. Arrant, Florissant, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Apr. 23, 1984, Ser. No. 603,000

Int. Cl.[4] A63C *19/12*

U.S. Cl. 273—27 **4 Claims**



1. Apparatus for removably covering a playing field with a non-rectangular-shaped, large section of heavy duty artificial turf, said apparatus comprising:

(a) at least one non-rectangular-shaped, large section of

heavy duty artificial turf comprising a mat of synthetic grass adhered to a shock-absorbing pad, said section having a straight edge and at least one oblique margin extending at an oblique angle from said straight edge;

(b) an elongated cylindrical core, wherein said straight edge of the section of artificial turf is fastened to said core;

(c) at least one belt removably attached to said oblique margin, said belt extending perpendicularly from said straight edge substantially as far as the most distant margin from said straight edge, and said belt having a thickness substantially the same as said artificial turf;

(d) at least one powered roller adapted to support and drive a roll of said turf on said core;

(e) means for pulling leading margins of said turf; and

(f) means for developing a pneumatic cushion under said section when said section overlays said playing field.

4,588,190

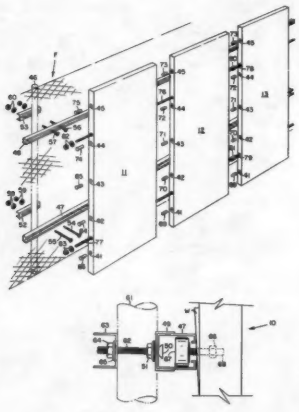
BALL REBOUND APPARATUS

James R. Stewart, San Antonio, and Charles F. Allen, Boerne, both of Tex., assignors to S & N Manufacturing, Inc., San Antonio, Tex.

Continuation-in-part of Ser. No. 172,838, Jul. 28, 1980, abandoned. This application Aug. 5, 1982, Ser. No. 405,692

Int. Cl.[4] A63B *61/00*

U.S. Cl. 273—29 A **8 Claims**



1. A recreational ball rebound wall apparatus comprising:

a plurality of rigid, portable panels having upper and lower edges and a weather resistant exterior for securing in abutting relationship to form a vertical, planar rebound wall;

means for securing the panels in abutting relationship to a support means including a plurality of vertically spaced, horizontal tracks and sliding means operatively engaging the tracks spaced intermediate said upper and lower edges so the plurality of panels can be slid along the tracks into abutting relationship to facilitate installation of the plurality of panels; and

wedges for selective insertion in between at least one of the panels and the horizontal track to position the panels to form a flat, planar surface when the panels are in abutting relationship.

4,588,191

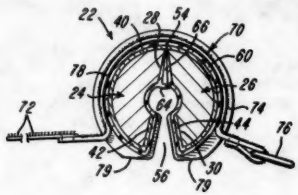
GOLF CLUB WEIGHTING DEVICE

Donald R. Stewart, 2565 Yellow Springs Rd., Springfield, Ohio 45506

Continuation-in-part of Ser. No. 462,412, Mar. 1, 1983, abandoned. This application Nov. 27, 1984, Ser. No. 675,141

Int. Cl.[4] A63B *69/36*

U.S. Cl. 273—194 B **10 Claims**



1. A unitary golf club weight which is self-contained so that it does not require assembly or disassembly of component parts for use comprising a pair of substantially identical clamp jaws made from high specific gravity metal, each of said clamp jaws being formed as a generally hemispherical sector and having a generally planar surface with a shaft-receiving groove extending axially completely from the top to the bottom thereof and having an arcuate contour for engaging a golf club shaft which may be either straight or tapered, an elastomeric material coating at least said planar surface of each of said jaws and including the entire length of said grooves, and flexible clamp means connected to and extending around the girth of said jaws for holding said jaws together along adjacent side edges of said jaws and engaged with a golf club shaft along any part of the lenght thereof with said generally planar surfaces and aid grooves confronting one another, said clamp means comprising a cinch strap extending around said jaws substantially centrally between the tops and bottoms thereof by which the opposite side edges of said jaws maybe brought toward one another with said grooves engaging said golf club shaft, said adjacent edges of said jaws being so contoured that said jaws may move with respect to one another as said cinch strap is drawn tight so that said jaws are drawn into clamping engagement with said shaft along the entire length of said grooves.

4,588,192

FINANCIAL FUTURES GAME

Pedro Laborde, P.O. Box 21718, UPR, Rio Piedras, P.R. 00931

Filed Sep. 15, 1983, Ser. No. 532,381

Int. Cl.[4] A63F *3/00*

U.S. Cl. 273—240 **8 Claims**

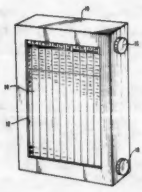
1. A game for simulating financial futures market transactions to be played by at least two players, comprising:

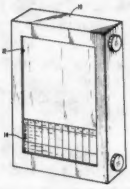
(A) a chart display including fixed data representing cash market prices, futures market prices, basis, and spread of both long- and short-term financial futures instruments contracts on a daily basis, for a predetermined number of playing days plus a predetermined number of trading days prior to the start of the playing days;

(B) means for displaying the current playing day plus all the trading day and playing days prior to the current playing day, while obscuring all future playing days on said chart; said displaying means comprising a holder with a display window and means for moving said chart display relative to said window, said moving means comprising a pair of rollers to which the ends of said chart are affixed, whereby said chart moves past said window when one of said rollers is turned, said window being of a size that the full chart display will appear therein on the last of said predetermined number of playing days;

(C) means for effecting an exchange of cash;

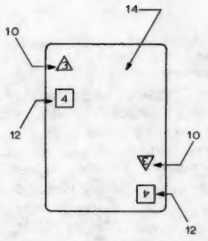
(D) play Treasury Bonds having a given face value and coupon rate;
(E) play orders to emit a 90-day Certificate of Deposit for a given face amount and current rate in a given number of playing days;





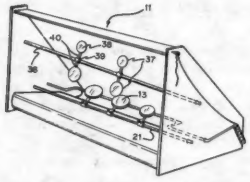
(F) record forms for each player to record his portfolio net worth on a given day, his hedging, spreading and pure speculation operations; and
(G) means for awarding prizes to players.

4,588,193
TWO-VALUE PLAYING CARDS
Scott E. Winston, Eagle Rock Village-Bldg. 19, Apt. 3B, Budd Lake, N.J. 07828
Filed Aug. 17, 1984, Ser. No. 641,864
Int. Cl.[4] A63F *1/00*
U.S. Cl. 273—304 **6 Claims**



1. A deck of playing cards comprising between 45 and 70 cards, each of said cards being of generally the same configuration, preferably rectangular and of standard size, and having visually similar rear faces;
each of said cards is delineated into two display areas, and in each display area there is a first symbol designating a suit which is confined to between two and eight different possibilities, coupled with a second symbol designating a value which is confined to between two and eight different possibilities depending on the specific deck;
the two display areas of the cards of a given playing card deck are comprised such that every specific suit-value pair is coupled once with every other specific suit-value pair in the minimum number of cards;
the same suit-value pair does not appear in both display areas of any individual card within a given playing card deck;
the two display areas of any given card are not visually distinctive, and are designed such that the two display areas appear near the upper lefthand corner of the front face in a right-side-up position, and also near the lower righthand corner of the front face in an upside-down position, whereby on a normal sized playing card (6.25 cm×8.75 cm) one display area (hereby denoted as suit-value 1) should appear within 2 cm of the upper lefthand corner of the card, and the other display area (hereby denoted as suit-value 2) should appear directly below suit-value 1, between 2 cm and 4 cm from the upper lefthand corner of the card and drawn to the same scale as suit-value 1 in a manner such that when the card is rotated 180° clockwise, the display areas should reappear in the upper lefthand corner, only the positions of suit-value 1 and suit-value 2 should be reversed.

4,588,194
TARGET DEVICE WITH REMOTE RESETTING MEANS
Daniel L. Steidle, and Patrick J. Steidle, both of 9540 Lansford Dr., Cincinnati, Ohio 45242
Filed Feb. 4, 1985, Ser. No. 697,725
Int. Cl.[4] F41J *1/14, 7/04*
U.S. Cl. 273—391 **15 Claims**



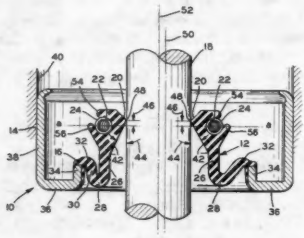
1. A target device comprising a plurality of spaced individual targets mounted on a pivot bar, said targets being mounted so as to move from a normal upright position to a knock-down position upon impact with a projectile, said device comprising:
(a) A housing with an open front face, a back panel capable of withstanding the impact of a projectile and acting as a back-stop, a bottom panel and two side panels;
(b) a horizontal target pivot bar extending to each of the side panels of the housing;
(c) a plurality of targets positioned on the target pivot bar at spaced intervals, said targets comprised of (1) a target face, (2) an attachment means for permanent mounting on the target pivot bar and which allows the target to pivot thereon and (3) a connecting bar between the target face and attachment means, said connecting bar angled such that when the target is in a normally upright position, the target face is held off the bottom panel; and
(d) a return means for resetting the targets from a knock-down position to a normally upright position from a remote location, said return means comprising (1) a return bar positioned behind the target pivot bar wherein at least one end of the return bar passes through a side panel, said return bar being configured such that as it revolves about its axis a portion of it comes in contact with the targets and moves them from a knock-down position to an upright position and wherein the one end, after passing through the side panel, is bent at an angle such that it extends back from the open face of the housing (2) a spring attached at its first end to the extremity of the return bar which is bent and attached at its second end to the side panel and (3) a cord extending from the extremity of the return bar through a guide means attached to the side panel and then to a remote location wherein a pull on the cord will cause the return bar to revolve about its axis thereby causing the targets to move from a knock-down position to a stable upright position and release of the cord will release tension on the spring means which in turn will allow the return bar to return to its rest position.

4,588,195

FLOATING LIP SEAL ASSEMBLY WITH CONVOLUTED FLEXIBLE SECTION

Joseph Antonini, Chicago, and Paul E. Gallo, Berwyn, both of Ill., assignors to Dana Corporation, Toledo, Ohio

Filed Nov. 22, 1985, Ser. No. 800,862
Int. Cl.[4] F16J *15/32*
U.S. Cl. 277—153 **10 Claims**



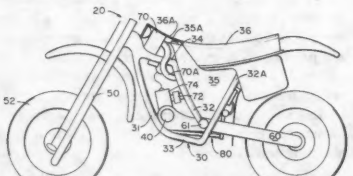
1. In an annular shaft seal of the type including a continuous sealing lip disposed for sealing against oil flow through and between a bore and a shaft extending therethrough, said seal having a rigid case support disposed for engaging said bore, an annular flexible portion connecting said sealing element with said case support to provide radial float of said lip with respect to the shaft relative to said case support; an improvement comprising: a first annulus from which said sealing element extends, said first annulus extending parallel to the axis of said shaft, a second annulus integrally coupled to said first annulus through a first reverse bend, said second annulus radially extensible relative to said axis, and a third annulus integrally connected through a second reverse bend to said second annulus, said third annulus extending parallel to said axis and rigidly affixed to said case support, said second reverse bend having a radial thickness less than the thickness of said first reverse bend.

4,588,196

TORSION SUSPENSION SYSTEM FOR MOTORCYCLES HAVING IMPROVED CENTER OF GRAVITY

John E. Williams, Jr., Duquesne, Pa., assignor to AAKAC Industries Inc., Apollo, Pa.

Continuation-in-part of Ser. No. 389,664, Jun. 18, 1982, Pat. No. 4,451,065. This application May 23, 1984, Ser. No. 613,258
The portion of the term of this patent subsequent to May 29, 2001, has been disclaimed.
Int. Cl.[4] B62K *25/28;* B60K *15/00*
U.S. Cl. 280—5 A **18 Claims**



1. A motorcycle having an improved center of gravity, the motorcycle having:

(a) a torsion bar suspension system;

(b) a frame having a front and rear wheels with a motor located in said frame and a driver's seat mounted on said frame;

(c) a swing arm having a pivot point on one of the frame and the motor, comprises at least one arm supporting a wheel, the swing arm permitting the wheel to rotate about a generally horizontal axis and to move in a generally vertical direction with respect to the pivot point axis of said swing arm;

(d) a torsion bar suspension member having a first end portion and a second end portion and mounted at an angle with respect to the pivot point axis, the first end portion secured to one of said frame and said motor, and said second end portion being rotatably carried by one of said frame and said motor;

(e) a lever arm having a first end and a second end, the first end rigidly attached to said torsion bar; and

(f) a linkage means pivotally connected to said swing arm and to said second end of said lever arm, said swing arm, linkage means, lever arm and torsion bar connected such that movement of the swing arm displaces said linkage means thereby forcing said lever arm to twist said torsion bar, the linkage means and the lever arm connected so as to provide an apparent increase in spring rate of the torsion bar as the wheel displaces the swing arm; and

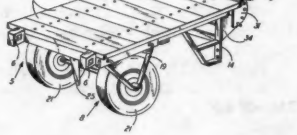
(g) a fuel tank having at least a portion thereof fixedly mounted in said frame below said driver's seat.

4,588,197

MODULAR HAND CART

Alfred P. Benedetto, Jr., P.O. Box 122, Fremont, N.H. 03040

Filed Aug. 18, 1983, Ser. No. 524,431
Int. Cl.[4] B62B *1/04*
U.S. Cl. 280—47.18 **16 Claims**



1. A modular hand cart comprising:

a main cargo support module including a front end, a rear end, and frame means extending longitudinally between said ends, said frame means having a plurality of mounting means at locations spaced longitudinally therealong from adjacent the front end toward the rear end;

an undercarriage module having at least one wheel and mounting assembly located and dimensioned to cooperate with said frame means to mount said undercarriage module to said frame means at any desired one of said plurality of mounting means locations, wherein the mounting assembly comprises a plurality of rods positioned, supported and dimensioned to engage a like plurality of spaced apart openings in the longitudinal frame members and spring biased into a position in which they engage those openings when said undercarriage module is in a desired position relative to said support module wherein a manually operable lever is interconnected with said rods to move said rods against said spring bias to release said undercarriage from said support module; and

a headboard module pivotally attached to said rear end for pivotal movement to and through a plurality of angular orientations relative to said support module;

means for locking said headboard module in any one of said desired orientations; and

adjusting means operable to release said locking means to permit a desired change in said orientation;

handle means pivotally attached to said headboard module; and

handle adjusting means for locking said handles in any desired one of a plurality of orientations relative to said headboard module.

4,588,198

STEERING SYSTEM HAVING CONTROLLABLE DAMPER

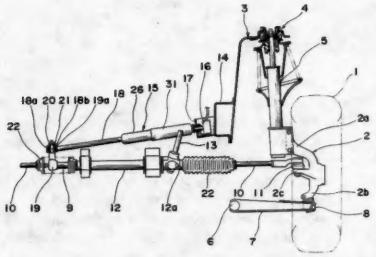
Hirotaka Kanazawa; Seita Kanai, both of Hiroshima, and Shirou Nakatani, Higashihiroshima, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Aug. 13, 1984, Ser. No. 640,321

Claims priority, application Japan, Aug. 20, 1983, 58-151955; Aug. 20, 1983, 58-151956; Aug. 20, 1983, 58-151957; Aug. 20, 1983, 58-151958; Aug. 20, 1983, 58-151959

Int. Cl.[4] B62D *1/20, 3/12*

U.S. Cl. 280—90 **13 Claims**



1. A steering system in an automobile comprising, in combination:

a steering wheel assembly including a steering wheel and a steering shaft rotatable together with said steering wheel;

a steering linkage connecting between spaced apart wheel carriers for the support of respective road wheels thereon;

a steering gear operatively connecting between the steering shaft and the steering linkage for, when the steering wheel is rotated in one of the opposite directions from a neutral position, causing the steering linkage to displace in one of the opposite directions generally longitudinally thereof for steering the road wheels, said steering wheel assembly, said steering linkage and said steering gear altogether constituting a motion transmitting mechanism for transmitting a rotary motion of the steering wheel to the road wheels;

an adjustable damper capable of exerting an adjusted damping force and disposed between a portion of a body structure of the automobile and a portion of the steering linkage for minimizing an oscillatory motion of the steering linkage in a direction generally longitudinally thereof;

means for adjusting the damping force exerted by the damper;

a first means for detecting a parameter representative of the steered condition of the road wheels and generating a parameter output indicative of the parameter when said parameter detected thereby deviates from a predetermined quantity;

a second means for detecting, and generating a velocity signal indicative of, the velocity of run of the automobile; and

a control means capable of generating a control signal only when the parameter exceeds the predetermined quantity during a low speed drive of the automobile, said adjusting means being activated in response to the control signal to reduce the damping force exerted by the damper.

4,588,199

SWIVEL CONNECTION FOR TRAILERS

William E. Fisher, 3318 S. 114 E. Ave., Tulsa, Okla. 74145

Filed Feb. 24, 1984, Ser. No. 583,441

Int. Cl.[4] B60D *1/00*

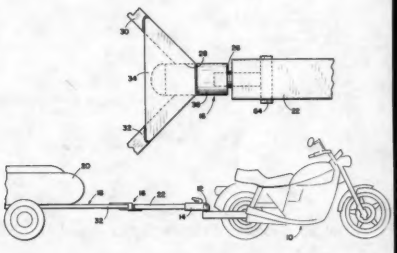
U.S. Cl. 280—204 **2 Claims**

1. Apparatus for connecting a vehicle hitch assembly to a trailer comprising:

an elongated bar member extending generally horizontally from the vehicle hitch assembly, the bar member being of inverted U-shaped cross-sectional configuration;

a spindle member secured at one end to and in alignment with said bar member and within the U-shaped cross-sectional configuration thereof, the other end portion of the spindle member extending beyond said bar member in the direction away from the vehicle hitch assembly;

a bearing assembly formed in a housing and bearings therein received on the other end of said spindle member, the bearing assembly housing being secured to the trailer, the trailer being thereby rotatable relative to said spindle member;



an elongated deflectable strap of spring steel affixed at one end to and extending in a horizontal plane of said bearing assembly housing and extending parallel to and below said bar member; and

a cross strap affixed to the other end of said deflectable strap and in engagement with said bar member, the cross strap being downwardly deflected as said bearing assembly housing is rotated relative to said bar member, resiliently deflecting said deflatable strap, said deflectable strap tending to maintain said bar member and said bearing assembly housing, and thereby the vehicle and trailer, in stabilized relative rotational orientation while nevertheless permitting rotational disorientation.

4,588,200

BRAKING ARRANGEMENT FOR WHEELED VEHICLE

Takashi Kanamori, Hamamatsu, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Japan

Filed Aug. 6, 1984, Ser. No. 638,043

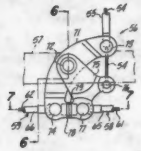
Claims priority, application Japan, Aug. 4, 1983, 58-142812; Aug. 11, 1983, 58-145630

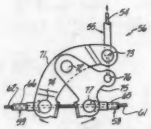
Int. Cl.[4] B62K *17/00*

U.S. Cl. 280—269 **3 Claims**

1. A wheeled vehicle having a frame means, a pair of driven wheels rotatably journaled at one end of said frame means, a pair of dirigible front wheels supported for steering movement at the other end of said frame means, a steering shaft for steering said front wheels and journaled on the longitudinal center line of said vehicle, a mechanical brake actuator juxtaposed to said steering shaft, a bowden cable actuator having a wire actuated by said brake actuator and a surrounding protective sheath, a linkage system brake equalizing device mechanically actuated by said brake actuator and disposed on the longitudinal center line of said vehicle, and means for actuating front brake assemblies associated with said front wheels from said equalizing device, said linkage system comprising a first lever pivotally supported intermediate its ends on said frame and having one end thereof adapted to actuate the brake associated with one of the front wheels, a second lever pivotally supported relative to said first lever about said pivot axis, means for pivotally connecting one end of said second lever to the other of said front wheel brakes for actuating said other front wheel brake and means for pivotally connecting the other end

of one of said levers to said wire and the other end of the other of said levers to said protective sheath for pivoting said levers





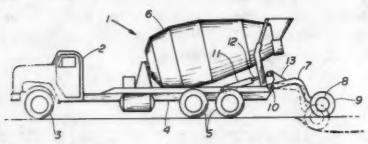
in an opposite direction upon operation of said mechanical actuator.

4,588,201

HYDRAULIC SYSTEM FOR AN AUXILIARY LOAD TRANSFER DEVICE

William J. Mohrbacker, Milwaukee, Wis., assignor to Rexworks Inc., Milwaukee, Wis.

Filed Dec. 28, 1984, Ser. No. 687,007
Int. Cl.[4] B62D *61/12*
U.S. Cl. 280—405 R **5 Claims**



1. A hydraulic system for an auxiliary load-transfer device mounted on the rear of a truck, comprising:

hydraulic cylinder means having opposite ends interposed between the truck and the load-transfer device and operable to provide selected support of the rear of the truck by said load-transfer device;

pump means operable to provide fluid under pressure to said cylinder means;

a first hydraulic line interposed between said pump means and one end of said cylinder means;

a second hydraulic line interposed between the other end of said cylinder means and tank;

a pump output pressure control means including a third hydraulic line and operable to provide a pressurized fluid control signal in said third line to selectively control output pressure of said pump means in said first line;

control valve means operable to control the flow of pressurized fluid in said first and second lines to extend and retract said cylinder means; and

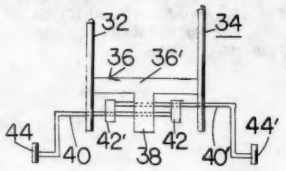
sequence valve means operable in response to the difference in pressure between said first hydraulic line and said third hydraulic line between a closed position and an open position directing fluid from said first line to tank, said sequence valve means is located between said control valve means and said pump means, and said sequence valve is located in a fourth hydraulic line communicating between said first and second hydraulic lines.

4,588,202

CART FOR TRANSPORTING COMPUTER COMPONENTS

James Villaveces, 3300 San Luis St., Ventura, Calif. 93003

Filed Oct. 1, 1984, Ser. No. 655,761
Int. Cl.[4] B62B *1/04*
U.S. Cl. 280—655 **12 Claims**



1. A cart for use in transporting computer instruments, luggage, and the like, comprising:

a main frame having at least one pair of rollers for rollingly supporting said main frame for transport;

torsion bar suspension means supporting said at least one pair of rollers, said torsion bar suspension means comprising a first torsion bar having a first end to which is mounted one of said rollers, and a second end spaced from said first end; and a second torsion bar having a first end to which is mounted another of said rollers;

said main frame having means for slidingly mounting each of said torsion bars therein, said means comprising at least a pair of openings so that said pair of torsion bars are received therein for sliding movement and rotational movement relative to said means;

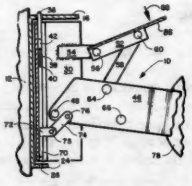
said torsion bar suspension means further comprising a first connecting block fixedly connected to the second end of said one torsion bar, and a second connecting block fixedly connected to said another torsion bar at the second end thereof; each of said connecting blocks further having a through-hole through which the torsion bar not fixedly connected thereto is slidingly mounted so that the respective connecting block has relative movement relative to the torsion bar not fixedly connected to it.

4,588,203

RETRACTABLE WHEEL STRUT ASSEMBLY

Milan B. Anderson, 1225 Frontage Rd. - Space 7, Chula Vista, Calif. 92011

Filed Oct. 9, 1984, Ser. No. 658,583
Int. Cl.[4] B63C *1/00*
U.S. Cl. 280—47.13 B **10 Claims**



1. A retractable wheel strut assembly comprising:

a single mounting bracket having upper and lower surfaces for fixedly attaching said retractable wheel strut assembly to an object to be supported thereby;

a wheel strut comprising a first arm portion pivotally attached to said mounting bracket about a vertical axis and pivotable between stowed and wheel deployable positions and a second arm portion with a wheel rotatably attached at one end thereof said second arm portion being pivotally

attached to said first arm portion for pivoting about a horizontal axis between a wheel stowed and wheel deployed position;

first locking means attached to said first arm portion for locking said first arm portion to said mounting bracket to prevent rotation thereof when in said stowed and wheel deployable positions said first locking means comprising a first and a second translating pin, said first pin engaging an aperture in said upper surface of said first arm portion when in said stowed or wheel deployed positions and said second pin engaging an aperture in said lower surface when said second arm portion is in said wheel deployed position; and

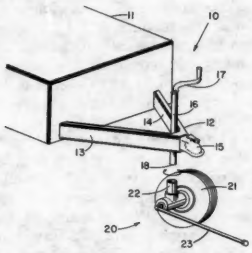
a second locking means positioned between said first and second arm portions for locking said second arm portion in said wheel stowed and wheel deployed positions.

4,588,204

TRAILER HITCH CADDY

James R. Reed, 7121 E. Pleasant Run Pkwy. S. Dr., Indianapolis, Ind. 46219

Filed Mar. 8, 1984, Ser. No. 587,615
Int. Cl.⁴ B60D *1/00*
U.S. Cl. 280—476 R **12 Claims**



1. A pull caddy for a trailer having a hitch with a downwardly extending support post comprising:

an axle with opposite ends and a horizontal axis extending longitudinally therethrough;

a single wheel rotatably mounted to said axle about said horizontal axis and positioned at one, and only one, of said ends remaining perpendicular to said axle at all times;

an upright member mounted to said post between said ends and sized to fittingly hold above ground said downwardly extending support post; and,

a handle mounted to the other of said opposite ends and having a pivot axis the same as said horizontal axis and being independent of movement of said member.

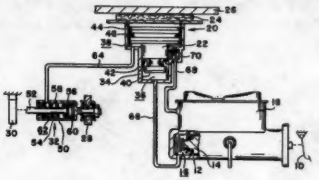
4,588,205

BRAKE SYSTEM

Robert F. Gaiser, Stevensville, Mich., assignor to Allied Corporation, Morristown, N.J.

Filed Sep. 21, 1984, Ser. No. 653,002
Int. Cl.⁴ B60G *11/14*
U.S. Cl. 280—725 **6 Claims**

1. A brake system for a vehicle having a brake assembly coupled to an axle which resiliently supports a vehicle body, the vehicle including a control rod extending between the body and the axle to limit the movement therebetween and transmit braking torque from the axle to the body, a master cylinder carrying a first piston to communicate fluid pressure to the brake assembly during braking, the master cylinder carrying a reservoir containing fluid, the brake assembly including a second piston substantially defining a first pressure chamber receiving fluid pressure from the master cylinder during braking, and the second piston also defining a second pressure chamber receiving fluid pressure during braking, characterized in that said control rod defines an auxiliary chamber which is pressurized during braking in response to



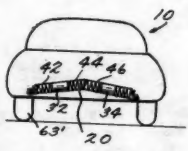
movement between the body and the axle and said auxiliary chamber communicates fluid pressure to said second pressure chamber in support of said first pressure chamber.

4,588,206

VEHICLE STABILIZER

Connie A. Powers, 7710 Maple Ave., Takoma Park, Md. 20912

Filed Jun. 20, 1984, Ser. No. 622,630
Int. Cl.⁴ B60R *27/00*
U.S. Cl. 280—758 **6 Claims**



1. A vehicle stabilizer for mounting on a rear portion of a vehicle, said stabilizer comprising:

an inverted V-shaped hollow tubular member adapted to be secured to said vehicle and transversly to the longitudinal axis of the vehicle;

end members covering the ends of said tubular member and cooperating with said tubular member to form a chamber within said tubular member;

first and second weights located within said chamber to be normally positioned symmetrically with respect to the longitudinal axis of the vehicle; and

resilient means within said chamber and in operative relationship with said weights for yieldingly urging said weights away from said end members and the center of said tubular member.

4,588,207

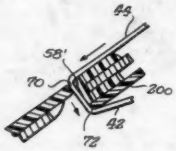
FREE-FALLING, SELF-LOCKING ADJUSTABLE TIP ASSEMBLY

Gerald A. Doty, Crown Point, Ind., assignor to Gateway Industries, Inc., Hazel Crest, Ill.

Continuation-in-part of Ser. No. 439,895, Nov. 8, 1982, abandoned, and Ser. No. 494,569, May 13, 1983, Pat. No. 4,480,854. This application Nov. 5, 1984, Ser. No. 668,024
Int. Cl.⁴ A62B *35/00*
U.S. Cl. 280—801 **3 Claims**

1. In a safety belt apparatus, the combination comprising: a safety belt having a shoulder portion and a lap portion, a seat belt retractor connected to one end of the safety belt and pulling on the belt for rewinding the belt and for pulling a portion of the belt into a generally vertical position when the belt is released for full retraction, a tip assembly slidably mounted on the belt and having a tongue plate for connection to a buckle, and snubber means on the tip assembly shiftable by the tongue plate hanging downwardly and with the belt in the

vertical position to allow free sliding of the tip assembly downwardly along the belt, said snubber means being shifted to a belt gripping position by the belt lap portion under tension from the retractor when the tongue plate is connected to the buckle,



said snubber means releasing the gripping action to allow transfer of belt from the shoulder portion into the lap portion at a predetermined force applied by the lap portion to said snubber means.

4,588,208

SAFETY BELT

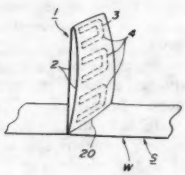
Noritada Yoshitsugu, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan

Filed May 9, 1984, Ser. No. 608,450

Claims priority, application Japan, May 11, 1983, 58-69944[U]; Jan. 13, 1984, 59-3850[U]

Int. Cl.⁴ B60R *22/28*

U.S. Cl. 280—805 **7 Claims**



1. A safety belt secured to a seat for supporting an occupant comprising:

an elongated webbed strap having shoulder portion means and waist portion means for retaining the seated occupant in the seat, said waist portion having end straps and expansion means for increasing the tensile strength of said waist portion means, said expansion means including at least one folded member at predetermined positions along said waist portion means and having a pair of strap sections joined along a common crease, each of said strap sections having a substantially corresponding length and being folded along said crease to be in substantially abutting relation, said pair of strap sections having abutting end surfaces opposite said crease, said end surfaces integrally connected to said waist portion means, said expansion means also including woven means for interconnecting said strap sections, said woven means including more than one U-shaped stitch extending longitudinally along said folded member, said expansion means also including suture means connecting said folded strap sections for further increasing the tensile strength provided by said expansion means.

4,588,209

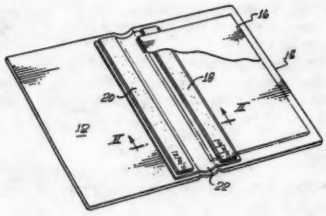
POWERFUL MAGNETIC FOLIO

Greg Zebrowski, Manhattan Beach, and Ghanshyam H. Popat, Cucamonga, both of Calif., assignors to Avery International Corporation, Pasadena, Calif.

Filed Sep. 11, 1984, Ser. No. 649,536

Int. Cl.⁴ B42D *3/00, 3/02*

U.S. Cl. 281—45 **18 Claims**



1. A magnetic folio or notebook comprising:

first and second notebook covers hingedly secured together at a central binding;

a thin strip of permanent magnet material mounted on one of said covers near said binding;

a second thin strip of permanently magnetized material;

means for mounting said second strip of permanent magnet material for pivotal movement to overlie said first strip to enclose and clamp 20 or more sheets of paper between the two magnet strips; and

said first magnet strip having a series of alternate north and south pole areas along its surface extending from one end to the other of said magnet strip, with each north and each south pole area extending substantially all of the way across the transverse width of said magnet strip, and with the extend of said areas in one direction being not more than twice the extent thereof in the perpendicular direction;

and said second magnet strip having a corresponding set of opposed series of south and north pole areas along its length, with the south poles matching the north poles of the first strip, and the north poles of said second strip matching the south poles of said first strip,

whereby more than thirty sheets of plain paper are normally held between said magnet strips, and sheets may be easily added or removed by pivoting said magnet strips apart.

4,588,210

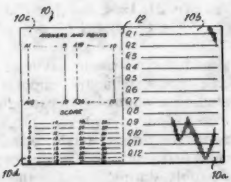
FOLDING GAME BOOK

Jack Tabatch, Rye; Warren Tabatch, New York, and Shane Tabatch, Rye, all of N.Y., assignors to Peer Group Communications Corporation, Rye Brook, N.Y.

Filed Apr. 11, 1984, Ser. No. 599,099

Int. Cl.⁴ B42D *15/00*; G09B *19/22*

U.S. Cl. 283—63 R **6 Claims**



1. A folding game book comprising a plurality of games and further comprising a plurality of sheets, each sheet having contained thereon one or more complete games, each of said sheets being folded once along a fold line in an identical man-

ner so as to provide each sheet with a first panel, a second panel, a third panel and a fourth panel, said second panel and said third panel being formed on opposite sides of the fold line of each of said sheets from said first panel and said fourth panel thereof, each of said sheets being imprinted to define at least one game independent of the games on said other sheets, said plurality of sheets being positioned so that the fold line of each sheet is in engaged alignment with the fold line of the sheets directly adjacent to it, and affixation means removably joining said plurality of sheets together at their aligned center lines, whereby when each individual sheet is removed from the folding game book, it is a complete and self contained entity.

4,588,211

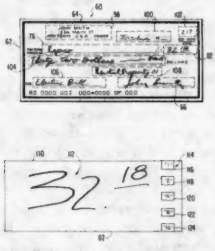
MACHINE READABLE DOCUMENT

Edwin B. Greene, P.O. Box 732, Greenbelt, Md. 20770

Continuation-in-part of Ser. No. 552,859, Nov. 17, 1983, which is a continuation-in-part of Ser. No. 277,015, Jun. 24, 1981, abandoned. This application Apr. 9, 1984, Ser. No. 598,110

Int. Cl.[4] B42D *15/00*

U.S. Cl. 283—70 **13 Claims**



1. A negotiable instrument operable for automatic bank scanning and processing comprising:

a planer member of generally rectangular configuration and having a width and height and bank identification information and an area for receiving a date of making of the negotiable instrument on one side thereof, said planer member further having a first field area on said one side for receiving indicia within said first field area designating a maker of the negotiable instrument, said planer member having a second field area on said one side for receiving indicia within said second field area designating a payee of the negotiable instrument and said planer member having a third area on said one side for receiving a numeric amount of said negotiable instrument;

coating means applied as a background upon said negotiable instrument within at least one of said first, second, and third field areas, said coating means being substantially invisible to the human eye under normal lighting conditions and being operable for receiving indicia placed within said at least one of said first, second, and third field areas and upon said coating means background, said coating means being further operable for selectively permitting a scanner to read the said at least one of said first, second, and third field areas of the negotiable instrument and for optically rendering indicia placed upon the coating means background readable by a scanning apparatus directing energy onto said negotiable instrument; and

code means corresponding to said at least one of said first, second and third field areas receiving said coating means and being operable for identifying the character of the information placed on top of said coating means wherein information located within said at least one of said first, second, and third field areas, regardless of location on the negotiable instrument, may be automatically detected, scanned and machine read.

4,588,212

DOCUMENT OF VALUE

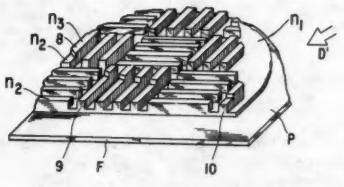
Rinaldo Castagnoli, Lausanne, Switzerland, assignor to De la Rue Giori S.A., Switzerland

Filed Aug. 29, 1984, Ser. No. 645,268

Claims priority, application Switzerland, Nov. 16, 1983, 6149/83

Int. Cl.[4] B42D *15/02;* **B44F** *1/10*

U.S. Cl. 283—91 **5 Claims**



1. A document of value having a safety design extending on one portion or the whole of the document, which comprises a background and at least two transistory images, wherein the entire surface of said safety design consists of juxtaposed groups of parallel raised segment lines having two different heights forming high and low raised lines extending alternately in two predetermined different directions, so that the segments of one group are not parallel to those of an adjacent group, the periphery of each group defining a plane geometrical pattern which is the same for all the groups of segments parallel to the same direction and is completed by the peripheries of the adjacent groups for forming the design surface, one portion of all the segments forming said high raised lines on the whole or part of their length, said first transitory image being formed by the high raised lines made of segments parallel to said first direction and pertaining to several groups, whereas said second transitory image is formed by the high raised lines consisting of segments parallel to said second direction and pertaining likewise to several groups, at least one portion of the segments forming said first and second image pertaining to adjacent groups, an image becoming visible when it is illuminated by light rays forming an acute angle with the plane of the design and parallel to a plane at least substantially perpendicular to the direction in which the image forming segments are parallel or when the design is observed from an acute angle and in a direction parallel to a plane at least substantially perpendicular to the direction to which the image forming segments are parallel, said segments or segment portions which pertain to the low raised lines forming with the gaps left between said segments the background of the design of said document of value.

4,588,213

THREADED PIPE CONNECTION

Charles A. Bollfrass, Houston, and Kenneth D. Chelette, Katy, both of Tex., assignors to Thread Technology International, Inc., Houston, Tex.

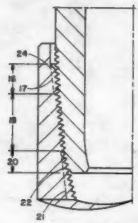
Filed Oct. 5, 1983, Ser. No. 538,768

Int. Cl.[4] F16L *55/00*

U.S. Cl. 285—187 **10 Claims**

1. A threaded pipe coupling formed for sealing connection with a tapered pipe thread formed on the perifery of a pipe adjacent the end thereof, the coupling comprising an internal mating pipe thread having: a first section of maximum diameter, a second section of lesser diameter and a third section of least diameter; the first section having a smaller taper angle than does the pipe tread with which it mates; the second section having a taper angle substantially the same as does the pipe thread with which it mates; the third section having a greater taper angle than does the pipe thread with which it mates such that upon assembly of the pipe and coupling, a greater radial

interference and thence a greater sealing force is exerted along the first section against external pressure and along the third



section against internal pressure than is exerted along the second section.

4,588,214

COUPLINGS FOR TUBES AND OTHER FLUID HANDLING COMPONENTS

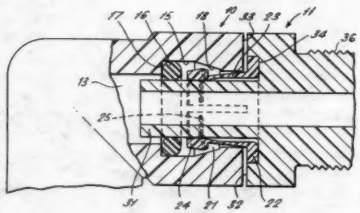
Timothy S. Guest, Maidenhead, United Kingdom, assignor to John Guest Limited, Middlesex, United Kingdom

Filed Nov. 8, 1983, Ser. No. 549,864

Claims priority, application United Kingdom, Dec. 13, 1982, 8235422

Int. Cl.[4] F16L *2/06*

U.S. Cl. 285—323 **2 Claims**



1. A coupling having two components, one component comprising a body portion with an open ended bore extending into the body portion, said bore having a tapered portion decreasing in diameter towards the open end of the bore, and a collet extending into the bore from said open end and having resilient arms in the bore and the second component having a tube adapted for insertion into said collet through the entry end to be resiliently gripped by the arms, the tapered bore having an interior wall which is engageable against the resilient arms to tighten the grip of the resilient arms on the tube when the second component is pulled in the outward direction from the bore in the first component, the collet having a portion with an outer end protruding out of the first component through said entry end of the bore, said second component having means for receiving and enclosing the outer end of the collet to prevent access to and pressing of said outer end in a direction which would release the collet from the second component by movement of the collet relative to the second component and inwardly into the bore of the first component.

4,588,215

JOINING TUBULAR MEMBERS

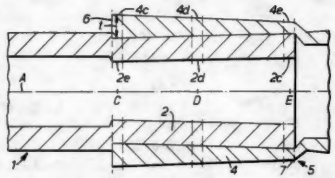
John Moxham, 104 Harkwood Drive, Hamworthy, Poole, Dorset, England BH15 4PF

Filed Sep. 20, 1982, Ser. No. 420,086

Claims priority, application United Kingdom, Sep. 23, 1981, 8128753

Int. Cl.[4] F16L *13/14*

U.S. Cl. 285—382.2 **19 Claims**



1. Apparatus comprising:

(a) first tubular member having an end portion forming a spigot with an external mating surface with a preformed diameter; and

(b) a second tubular member having an end portion forming a socket which defines a socket mouth; the socket having an internal mating surface with a preformed diameter less than the preformed diameter of the external mating surface of the spigot throughout the axial length of the mating surface thereof;

(c) the spigot being in interference fit with the socket along the mating surfaces to join together the first and second tubular members along the longitudinal axis of said tubular members and

(d) the end portion of at least one of the tubular members having a preformed wall thickness that varies in the axial direction, with the mating surface thereof before it is in interference fit with the other member being substantially cylindrical, such that the diameter of the external mating surface of the spigot and the mating diameter of the internal mating surface of the socket, when in interference fit with each other, are smaller at a first location on the axis that at a second location on the axis, the first location being nearer the mouth of the socket than the second location.

4,588,216

OVER-CENTER TOGGLE LATCH

Farley T. Hinds, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 14, 1984, Ser. No. 640,623

Int. Cl.[4] E05C *5/02*

U.S. Cl. 292—113 **6 Claims**

1. A toggle latch apparatus, comprising:

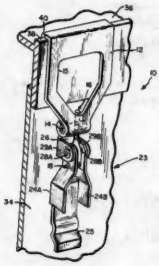
a latch arm, said latch arm having a hook at one end thereof, a barrel nut located at the other end thereof, said barrel nut having a threaded orifice therethrough, and an opening of predetermined size intermediate said hook and said barrel nut;

a stirrup;

a latch handle assembly, said latch handle assembly having a pair of projecting side walls, said side walls being pivotally connected at one end thereof to said stirrup, a grip element interposed between said pair of side walls at the other end thereof, said grip element being deformed upward toward its outer end and dimensioned to mate with said opening in said latch arm in an unlatched condition of said latch arm, and wherein each of said side walls define a journal therethrough; and

a draw bolt, said draw bolt including a threaded shaft adja-

cent one end thereof adjustably connecting said draw bolt to said threaded orifice in said barrel nut of said latch arm, said draw bolt further having a transverse pin hole adja-



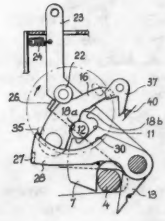
cent the other end thereof, and a pivot pin traversing said pin hole and journalled in said journal of each of said side walls of said handle assembly in order for said latch arm to pivot with respect to said handle assembly.

4,588,217

LATCH IN PARTICULAR FOR A VEHICLE DOOR

Gerard Escaravage, Valentigney, France, assignor to Aciers et Outillage Peugeot, Audincourt, France

Filed Dec. 29, 1983, Ser. No. 566,848
Claims priority, application France, Jan. 6, 1983, 83 00133
Int. Cl.[4] E05C *3/26*
U.S. Cl. 292—201 **9 Claims**



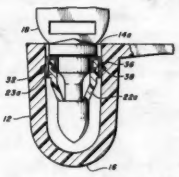
1. A latch in particular for a motor vehicle door, said latch comprising a latch mechanism, a case for said mechanism and a keeper movable relative to said case, the latch mechanism comprising a forked bolt for hooking onto said keeper in a hooking position of said bolt, a shifting lever having a first position for retaining the bolt in said hooking position and a second position for releasing said bolt so as to permit the opening of the latch, and an electric actuating device including an electric motor and transmission means and operative to bring said shifting lever to said two positions thereof, said latch futher comprising mechanical energy accumulating means connected to said transmission means for being loaded by said transmission means, retaining means for retaining said shifting lever in said first position, and a striker element for retracting said retaining means when said mechanical energy accumulating means are controlled to release their mechanical energy and thus allow the movement of the shifting lever to said second position for releasing the bolt.

4,588,218

SECURITY SEAL

Richard S. Guiler, Newton, and Peter Farbaniec, Colonia, both of N.J., assignors to E. J. Brooks Company, Newark, N.J.

Filed Oct. 31, 1983, Ser. No. 546,952
Int. Cl.[4] G09F *3/00*
U.S. Cl. 292—307 R **1 Claim**



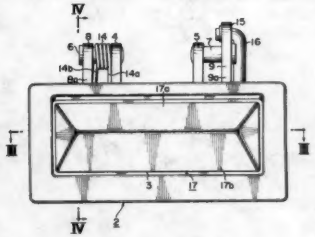
1. A security seal of the type comprising a housing, a shackle extending from the housing, and a stud at the remote end of the shackle, in which said housing has a closed rear end and an open front end, and a separate locking member and a separate locking member retainer in the open end of the housing, said locking member comprising a support collar and a series of resilient fingers extending inwardly from the collar forming an aperture for receiving the stud in locking engagement, said separate retainer being interposed between the housing and the support collar and having means engaging the inner surface of the housing and means engaging the support collar of the locking member whereby the locking member is retained in the housing, said locking member retainer comprises a circular member having external barbs projecting into the interior surface of the housing, a circular channel receiving the support collar of the locking member, and barbs on the interior of the channel projecting into the surface of the support collar.

4,588,219

DOOR HANDLE UNIT SUITABLE FOR USE IN AN AUTOMOBILE

Fumio Kobayashi, Ayase, and Hidenobu Kato, Hatano, both of Japan, assignors to Ohi Seisakusho Co., Ltd., Yokohama and Nissan Shatai Co., Ltd., Hiratsuka, both of, Japan

Filed Aug. 9, 1982, Ser. No. 406,549
Claims priority, application Japan, Aug. 13, 1981, 56-125967
Int. Cl.[4] E05C *3/26*
U.S. Cl. 292—336.3 **6 Claims**



1. A door handle system adapted for use in an automobile comprising:

a door panel having an outer surface and an inner surface and a recess present in the outer surface of said door panel, said recess including a bottom wall, side walls and an open top which is flush with the outer surface of the door, said door handle unit comprising:

an elbow-shaped handle arm pivotally secure to a door panel with its free end outwardly and retractably extendable through the bottom wall of said recess, said handle arm

being movable between an extended operable position and a retracted inoperable position;

means for biasing said handle arm to said retracted position;

a handle comprising a plate having an inner surface facing said recess, upper edge, lower edge and an outer surface, said outer surface being of sufficient size and shape to matingly fit within said recess at said recess top to substantially completely cover said recess, said plate having an upper pushing part located on the outer surface of said plate along the upper edge thereof and a pulling part located on the inner surface of said plate along the lower edge thereof;

a bifurcated stopper part formed on said handle inner surface, said stopper part having an upper portion and a lower portion disposed to straddle said handle arm free end such that said lower portion abuts said handle arm free end lower edge when said handle is in the closed position and such that said upper portion rocks integrally with said handle into abutment with said handle arm free end upper edge when said handle is in the opening position;

means for pivotally mounting said plate to said handle arm at the handle arm free end so that said plate is pivotable along its longitudinal axis and so that said plate outer surface is substantially flush with the outer surface of said door panel and substantially completely covers said recess open top, whereby said pushing part may be pivotally pushed manually inward from its flush mounted position into said recess when said handle arm is in said retracted inoperable position to thereby pivotally move the plate lower edge out of said recess into a manual access position to provide manual gripping of said pulling part to allow manual movement of said handle arm to said operable position; and

means for biasing said plate to said flush mounted position to maintain said plate flush with said door panel outer surface except when said plate is being manually pivoted to the manual access position to provide manual gripping of said pulling part to move said handle arm to said operable position.

4,588,220

STRUCTURE FOR REMOVABLY MOUNTING SUPPORT ROD FOR OPENABLE CLOSURE MEMBER OF MOTOR VEHICLE

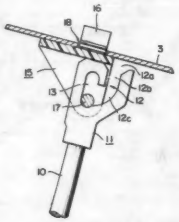
Tatsuhiko Matsui, Zama; Hiroyuki Aida, Hatano; Akira Watanabe, Mouka, and Miyoshi Masakazu, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited and Kato Hatsujo Kaisha, Ltd., both of Yokohama, Japan

Filed Oct. 5, 1983, Ser. No. 539,179

Claims priority, application Japan, Oct. 6, 1982, 57-175948

Int. Cl.[4] E05C *17/14*

U.S. Cl. 292—338 **2 Claims**



1. A structure for removably mounting a support rod for an openable closure member of a motor vehicle, comprising:

a support rod adapted, when mounted in position, to support the openable closure member at its open position;

a retainer member of a plastic material comprising a hook-like portion defining an engagement aperture, a thumb-like portion defining with said hook-like portion a guide passage the terminal end of which is in communication with said engagement aperture at one side thereof, and a shank portion integral with said hook-like portion and said thumb-like portion, said shank portion disposed at one end of the retainer member and said thumb-like portion disposed at the opposite end of said retainer member, said one end of said retainer member mounted onto one end of said support rod;

an anchor member comprising a first portion adapted to be anchored at a mounting aperture formed in one of the vehicle's body and the openable closure member, and a second portion adapted to be disposed in engagement with said engagement aperture of said retainer member through said guide passage, wherein said support rod is removably retained with respect to one of the vehicle's body and the openable closure member by virtue of the engagement between said retainer member and said anchor member;

said guide passage of said retainer member comprising a tapered entrance portion opened at one side of a top end of said retainer member, a substantially straight portion extending in substantially parallel relationship with the retainer member which is disposed in alignment with said support rod when said retainer member is mounted onto said support rod, and an inclined portion extending in communication with said substantially straight portion toward a center of said retainer member;

said engagement aperture of said retainer member being formed in such a manner as to extend along said retainer member and communicate, at one side thereof, with said inclined portion of said guide passage;

said first portion of said anchor member comprising an arrowhead-like leg adapted, when inserted in said mounting aperture, to be engaged with the opposite margins of said mounting aperture at the opposite sides thereof;

said second portion of said anchor member comprising a pin fixedly attached to opposite side walls of said anchor member in such a manner as to extend laterally of said anchor member.

4,588,221

SEGMENTED DOOR OPENER

Cardell E. Miller, Hudson; Gene A. Tracy, Amery, both of Wis.; George L. Engstrom, Minneapolis, and John Thorson, Roseville, both of Minn., assignors to Ideal Security Hardware Corporation, St. Paul, Minn.

Continuation of Ser. No. 474,550, Mar. 11, 1983, abandoned.

This application Jun. 25, 1985, Ser. No. 748,704

Int. Cl.[4] E05B *3/00*

U.S. Cl. 292—348 **7 Claims**

1. A door assembly configured for shipping prior to its being installed at an ultimate location, comprising:

(a) a closure panel having a panel aperture formed in a face thereof;

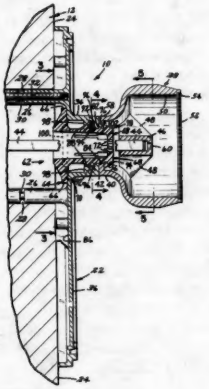
(b) a latching apparatus carried by said panel comprising a smooth spindle extending through said panel aperture and disposed for rotation about a spindle axis thereof along which said spindle is aligned in the direction along which it extends through said panel aperture;

(c) an escutcheon, having an escutcheon aperture formed therein, applied to said face with said escutcheon aperture overlying said panel aperture;

(d) a locking element having a locking element axis and held to said panel by said escutcheon wherein said locking element is substantially coaxially aligned with said spindle, said locking element including a plurality of resilient prongs extending through said escutcheon aperture and away from said escutcheon, each of said prongs having an end remote from said escutcheon carrying a prong shoulder facing toward said escutcheon; and

(e) a knob, separate from said panel, having a knob shoulder, wherein said resilient prongs of said locking element de-

flect radially inward to engage said knob shoulder, said knob held in fixedly secured position against said escutcheon thereby holding said knob against displacement in both axial directions relative to said escutcheon; wherein said spindle extends through said locking element to prevent further radial deflection of said resilient prongs when said assembly is completely assembled to thereby preclude



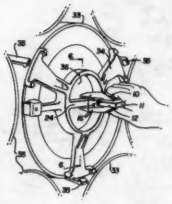
removal of said knob from said locking element; wherein said escutcheon holds said locking element which in turn holds said knob so that said escutcheon bears any axial loads on said knob and so that the spindle need only transmit a torque load from the knob to the remainder of the latching apparatus; and wherein said locking element is inaccessible when said door assembly is completely assembled.

4,588,222

ROCKET EXTRACTION DEVICE

Donald L. Martin, Maurertown, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 14, 1984, Ser. No. 640,629
Int. Cl.⁴ B66C *1/30*
U.S. Cl. 294—16 **14 Claims**



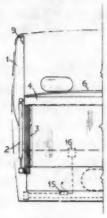
1. A rocket extraction device adapted to be held and operated by one hand of a user comprising a supporting frame including a crossbar, spaced coaxial shafts on said frame and being in spaced parallel relationship to the crossbar, pairs of opposing jaws pivotally held on said shafts with the pairs in spaced relationship, extension arms on the jaws and projecting therefrom toward said crossbar and having opposing cam faces and support shoulders adjacent to the cam faces, a finger grip bar movably disposed between said extension arms and being engageable with said cam faces and support shoulders and having end faces in opposing relationship to parts of said frame, and resilient means biasing said jaws toward separated positions, movement of the finger grip bar toward said crossbar causing closing of said jaws by camming action of the finger grip bar on said cam faces.

4,588,223

PARTITION SHIELD FOR AUTOMOBILE INTERIOR

Joseph Ledenyi, 27 Taverly Road, Willowdale, Ontario, Canada M2J 4E4

Filed Dec. 13, 1984, Ser. No. 681,098
Claims priority, application Canada, Apr. 30, 1984, 453106
Int. Cl.⁴ B62D *33/00*
U.S. Cl. 296—24 R **10 Claims**



1. A partition device for shielding an automobile interior front seat area from the rear seat area, comprising

two parallel side frame members having slider rail upper portions,

an elongated casing member mounted perpendicularly to said side frame members, said casing member having a U-shaped cross section,

a foldable shield comprising a plurality of rectangular panels with neighbouring panels hingedly secured to one another and having end portions therein slidably mounted to said slider rail upper portions of said side frame members, said panels being selectively extensible along said slider rail upper portons to form said shield and collapsible in a fan-fold manner to form a stack of said panels for storage in said casing member,

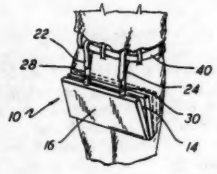
extensible piston means mounted to said side frame members and having extensible arm means therein coupled to an uppermost panel of said panels whereby said piston means is operative to draw said panels from said casing member to form said shield.

4,588,224

BELT-ATTACHED SEAT

George W. Hill, Jr., 316 Morris St., Ogdensburg, N.Y. 13669

Filed May 14, 1984, Ser. No. 609,811
Int. Cl.⁴ A47C *1/00*
U.S. Cl. 297—4 **10 Claims**



1. A transportable, foldable seating pad for suspension from a user's belt and reversible between either of two folded positions, said pad comprising:

(a) a layer of resilient foam material, foldable upon itself in either direction about a central fold line;

(b) a substantially waterproof material completely enclosing

said resilient material, conforming in shape thereto and foldable therewith; said waterproof material comprising first and second layers respectively covering opposite sides of said resilient material;

(c) a first pair of flexible, elongated strips affixed at one end to said waterproof material at spaced points along a first edge, parallel to said fold line, and extending to free ends;

(d) means for releasably attaching each of said first strips to themselves to form closed loops adjacent said free ends;

(e) a second pair of flexible strips affixed to said waterproof material at points spaced equidistantly with said first pair of strips along a second edge, opposite said first edge, whereby said second pair of strips has surface portions superposed with opposing surface portions of said first pair of strips adjacent said first edge when said resilient material is folded upon itself in either direction along said fold line; and

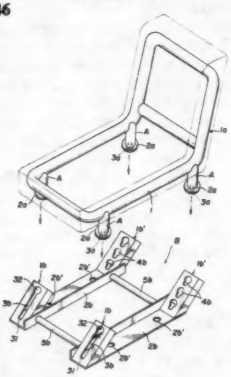
(f) means for releasably attaching said surface portions of said second strips to said superposed opposing surface portions of said first pair of strips, whereby said pad may be suspended from the rear of a user's outer garment which passes through the loops formed by said first pair of strips, and selectively moved between an unfolded and either of two folded positions wherein opposite ones of said first and second layers are outwardly exposed.

4,588,225

HEIGHT ADJUSTMENT MECHANISM FOR A VEHICLE SEAT

Takao Sakamoto, Akishima, Japan, assignor to Tachikawa Spring Co., Ltd., Tokyo, Japan

Filed Mar. 30, 1984, Ser. No. 595,354
Int. Cl.[4] B60N *1/02*
U.S. Cl. 297—346 **6 Claims**



1. A height adjustment mechanism for a vehicle seat comprising:

a support frame adapted to be rigidly fixed to a floor of the vehicle and including first and second pairs of support plates upwardly extending from said support frame, each support plate including means defining a load bearing surface which is downwardly and forwardly inclined relative to horizontal,

said pair of first support plates including means defining plural pairs of apertures spaced-apart relative to one another in a longitudinal direction of said vehicle seat, each said aperture pair for establishing a respective mounting position of said vehicle seat which corresponds to a predetermined mounting height thereof,

said second pair of support plates including means defining a pair of guide grooves elongated in the longitudinal direction of the vehicle seat; and

a seat frame including first and second pairs of leg members dependently rigidly fixed to said seat frame, each said leg member terminating in a receiving plate and an engagement pin extending substantially perpendicular to said receiving plate, each said receiving plate including means defining a load-transfer surface, at least said load transfer surfaces of said first pair of receiving plates being planar and inclined downwardly and forwardly relative to horizontal so as to conform to the downward and forward incline of said first pair of support plates,

said engagement pins of said second pair of leg members being respectively slidably received by said pair of elongated grooves and said engagement pins of said first pair of leg members being respectively received in a predetermined pair of said apertures such that said engagement pins of said second pair of leg members slide within said pair of elongated grooves when said first pair of engagement pins are removed from said predetermined pair of said apertures and engaged with another pair of said apertures, whereby the height of said seat is adjusted,

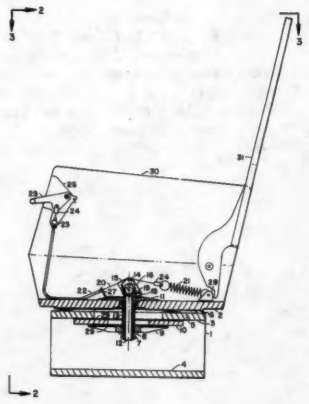
said load-transfer surfaces of said at least first pair of receiving plates and said load-bearing surfaces of said first pair of support plates being in confronting bearing contact with one another when said seat is in a selected said mounting position to thereby together form means for distributing loads applied to said leg members over said support frame to prevent said loads from being centralized upon said leg members.

4,588,226

ADJUSTABLE CHAIR FOR AIRCRAFT AND THE LIKE

Ronald L. Young, Menominee, Mich.; Eugene F. Rock, and David E. Brandt, both of Marinette, Wis., assignors to ERDA, Inc., Marinette, Wis.

Filed Dec. 23, 1983, Ser. No. 565,172
Int. Cl.[4] A47C *3/18*; B60N *1/02*
U.S. Cl. 297—349 **11 Claims**



1. An adjustment mechanism for a chair to permit horizontal and swiveling movement of the chair, comprising:

(a) a base including a top plate member, said top plate member being provided with a central opening;

(b) a rigid seat forming the bottom of said chair, said seat being formed with an opening;

(c) bearing means interposed between the bottom of said seat and the top of said top plate of said base to permit horizontal or swiveling movement of said seat, and thus said chair, relative to said base;

(d) a center post connected to said seat and extending downwardly through said openings in said seat and said top

plate of said base, said central opening in said top plate being sufficiently large to accommodate longitudinal and trasverse movement of said post and thus of said seat;

(e) a shaft positioned within said post for vertical movement within said post;

(f) brake means supported on the bottom of said shaft and adapted to tightly frictionally engage the top plate of said base for locking the seat in its adjusted position, said brake means including a lower brake plate and an upper brake plate, said lower brake plate being connected to said shaft for movement therewith, said upper brake plate being positioned between said lower brake plate and said top plate, said upper brake plate being formed with a generally central opening sufficiently large to accommodate longitudinal and transverse movement of said post and shaft, said central opening of said upper brake plate being smaller than said opening of said top plate member and said upper brake plate being dimensioned to overlap both the lower brake plate and the top plate;

(g) eccentric cam means operatively engaging the upper end of said shaft, and

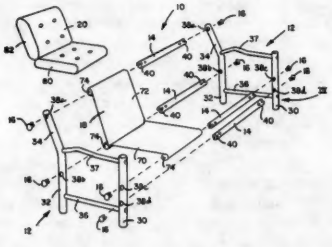
(h) means operatively connected to said cam means for rotating the same for vertically moving said shaft to release said brake means, and resilient means for thereafter returning said cam means to its original position again locking the seat, in its adjusted position, to said base.

4,588,227

FURNITURE ASSEMBLY

Barry G. Austin, Marshall, Mich., assignor to General Aluminum Products, Inc., Charlotte, Mich.

Filed Jun. 28, 1984, Ser. No. 625,706
Int. Cl.[4] A47C 5/10, 4/02
U.S. Cl. 297—440 **20 Claims**



1. A seating unit, comprising:

a pair of side assemblies, each said side assembly including a generally upright front leg and a generally upright rear leg, each said side assembly having said front leg and said rear leg interconnected, said rear legs having aligned mounting apertures therethrough, said front legs having aligned mounting apertures therethrough;

at least two lateral members adapted to interconnect said side assemblies, each said lateral member being passable through aligned mounting apertures in each of said side assemblies, each of said lateral members having at least one hollow end defined by a sidewall and having a locking recess in said sidewall within said hollow end;

a series of securing clips configured to be secured to said lateral members, each said clip having an enlarged head that will not pass through said aligned mounting apertures and a pair of spaced convergeable clip legs extending from said head, one of said clip legs having a locking tab shaped to be received in one of said locking recesses, and said clip having a relaxed condition, an insertion condition and a locked condition; in said relaxed condition, said clip legs and said locking tab being spaced too wide for telescoping receipt in said hollow ends; in said insertion condition, said clip legs being resiliently converged sufficiently for telescoping receipt in said hollow ends; and in said locked condition, said locking tab being positioned in said locking recess by said one clip leg and the other said clip leg being resiliently converged to bias said locking tab into said locking recess, such that when said seating unit is assembled and said clips are in a locked condition, said clips prevent the separation of said side assemblies from said lateral members by said locking tabs being received in said locking recesses and said enlarged heads abutting an outer side of at least one of said side assemblies;

a seat supported by said lateral members; and

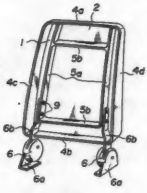
said side assemblies being slidable along said lateral members when a person is not seated on said seat, and said side assemblies frictionally locking on said lateral members when a person is seated on said seat so that said side assemblies are selectively convergeable to permit access to said locking tabs positioned in said recesses, whereby said seating unit is provided with the ability to be disassembled to a generally flat condition and assembled by said lateral members being received in said aligned mounting apertures with said clips being received in said lateral member hollow ends.

4,588,228

PAN-TYPE VEHICLE SEAT BACK MOUNTED TO A RECLINING MECHANISM

Akira Nemoto, Tokyo, Japan, assignor to Tachikawa Spring Co., Ltd., Japan

Filed Aug. 5, 1983, Ser. No. 520,642
Int. Cl.[4] A47C 7/02
U.S. Cl. 297—452 **7 Claims**



1. A vehicle seat comprising: a seat back frame having a substantially flat rear surface and including a bottom wall and a pair of opposing side walls integral with and upwardly extending from said rear surface, said bottom wall and pair of side walls together defining therebetween a recessed interior space, and means defining a plurality of longitudinal and transverse reinforcing ribs on said flat surface and disposed within said interior space for structurally reinforcing said seat back frame, wherein said reinforcing ribs define, together with a respective opposing one of said bottom and side walls, a mounting space, and wherein said bottom wall includes a pair of spaced-apart grooves disposed substantially parallel to said side walls;

a pair of reclining mechanisms each including a movable arm to permit reclination of seat back, each said movable arm being accepted within a respective groove and extending into said mounting space so that one end portion of each said movable arm is adjacently positioned relative to a predetermined said reinforcing ribs; and

securing bolt means for rigidly joining each said movable arm to said predetermined said reinforcing ribs, wherein a portion of said securing bolt means is retained in said mounting space while another portion of said securing bolt means is retained in said interior space, said bottom wall and side walls thereby concealing same.

4,588,229

SEAT CUSHION

Eric C. Jay, Boulder, Colo., assignor to Jay Medical, Ltd., Boulder, Colo.

PCT No. PCT/US83/00320, § 371 Date Oct. 13, 1983, § 102(e) Date Oct. 13, 1983, PCT Pub. No. WO83/03195, PCT Pub. Date Sep. 29, 1983
Continuation-in-part of Ser. No. 358,634, Mar. 16, 1982. This PCT application Mar. 4, 1983, Ser. No. 548,868
Int. Cl.[4] A47C *7/02*
U.S. Cl. 297—459 23 Claims

1. A seat cushion adapted to support a human body against gravity while militating against the build up of pressure over bony prominences of the body comprising:

a pad juxtaposed over a relatively rigid, shaped tray,

said pad comprising a flexible envelope comprising an upper surface, a lower surface, a front edge, and a rear edge, said envelope further containing a flowable fluid material,

said upper surface being sealed to said lower surface from said front edge to said rear edge to longitudinally segment said envelope into a right half and a left half, said flowable fluid in each longitudinally segmented half being isolated from the other said segmented half of said envelope,

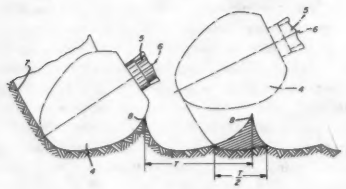
said tray including a plurality of upwardly extending rims, said rims including inwardly sloped portions adapted to urge the fluid filling material downward and under the sides of the user of said cushion.

4,588,230

CONTROL FOR MINING MACHINE

Herbert Schupphaus, Bochum, Fed. Rep. of Germany, assignor to Gebr. Eickhoff Maschinenfabrik und Eisengiesserei m.b.H., Bochum, Fed. Rep. of Germany

Filed Apr. 22, 1985, Ser. No. 725,916
Claims priority, application Fed. Rep. of Germany, Apr. 26, 1984, 3415502
Int. Cl.[4] E21C *35/08, 35/24*
U.S. Cl. 299—1 8 Claims



1. In a mining machine having means for traversing a ground surface and a universally-pivotal carrier arm of variable length which carries at its forward end a cutter drum rotatable about the axis of the carrier arm; the improvement in said mining machine which comprises:

a displacement pickup responsive to forward and aft movement of the cutter drum with respect to said ground surface, and

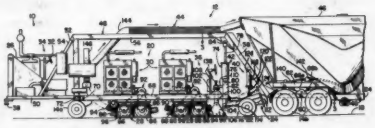
means connected to said displacement pickup for producing a first signal when said cutter drum has moved forwardly in an amount substantially equal to its length and for thereafter producing a second signal when the cutter drum is moved backwardly in an amount equal to a fraction of its length.

4,588,231

PAVEMENT SURFACING MACHINE

Louis E. Silay; James S. Stein, and John J. Kunzweiler, all of Sonora, Calif., assignors to Concrete Safety Equipment, Inc., Torrance, Calif.

Continuation of Ser. No. 343,308, Jan. 27, 1982, abandoned. This application Aug. 28, 1984, Ser. No. 645,022
Int. Cl.[4] E21C *47/00*
U.S. Cl. 299—39 12 Claims



1. Apparatus for surfacing a road, comprising:

a vehicle including main wheels, a main frame supported on said main wheels, a cutter support mounted to the main frame for movement toward and away from the road, and a traction wheel support associated with the main frame for movement toward and away from the road independently of the main wheels;

a road surfacing mechanism including cutter means mounted on said cutter support, cutter actuator means connected between said main frame and said cutter support for urging said cutter means downwardly against the road and raising said cutter means from contact with the road, and depth control means for controlling the cutting depth of said cutter means;

a propulsion mechanism including traction wheels mounted on said traction wheel support, traction wheel actuator means connected between said main frame and said traction wheel support for urging said traction wheels downwardly against the road and raising said traction wheels from contact with the road, and means for driving said traction wheels to move the vehicle in a preselected direction of travel when the traction wheels are in contact with the road; and

means for controlling said cutter actuator means to selectively raise and lower said cutter means and to urge said cutter means against the road at a first preselected variable pressure, and for independently controlling said traction wheel actuator means to selectively raise and lower said traction wheels and to urge said traction wheels against the road at a second preselected variable pressure.

4,588,232

APPARATUS FOR VARYING ECCENTRICALLY OF THE AXLE OF A BICYCLE WHEEL

Joo H. Kim, 2551 Loop 35 #701, Alvin, Tex. 77511, and Rack K. Choi, 208 Soong-Wuy, 2-dong, Nam-ku, Inchoen City, Rep. of Korea

Filed Sep. 7, 1984, Ser. No. 648,906
Int. Cl.[4] B60B *27/00, 35/00*
U.S. Cl. 301—1 6 Claims

1. An apparatus for varying eccentrically and centrically the shaft of the bicycle wheel comprising, an eccentric hub including a shaft housing formed integrally in eccentric position between two hub discs and a shaft penetrated through the shaft housing, said eccentric hub being supported rotatively in a fixed position on said shaft and said hub disc having at least four notches corresponding to different eccentricities of said shaft on its circumference of circle, two circular supporting plates including two cover plates and having a cover housing, a hub disc housing and a relatively large hole, respectively which are stepped outwardly on the concentric circle of the eccentric position so that said each hub discs of said eccentric hub is reversed revolvably between said each hub disc hous-

ings and each cover plates to adjust the eccentricity of said shaft, and a locking means fixed on said circular supporting

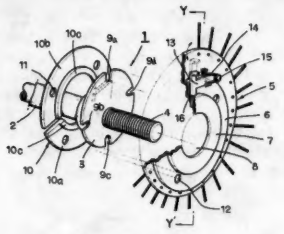


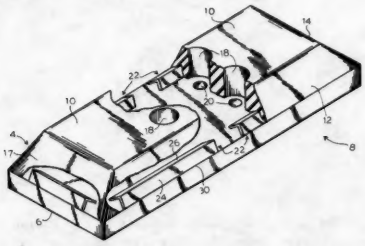
plate for setting said hub disc in the selected eccentricity of said shaft by matching it with any one of the notches.

4,588,233

PADDED RAIL PLATE FOR TRACKED VEHICLES

Leroy E. DenBesten, 1235 Rte. 9, Castleton-on-Hudson, N.Y. 12033-9648

Filed Jan. 27, 1984, Ser. No. 574,398
Int. Cl.[4] B62D *55/22*
U.S. Cl. 305—51 **4 Claims**



1. A padded rail plate for use on a tracked vehicle comprising:

a track rail plate adapted to be affixed to a track of a tracked vehicle;

a resilient pad means affixed to a surface of the track rail plate in order to protect the track rail plate and a road surface to be contacted thereby from damage during use;

an anchor means which provides a bearing surface for the resilient pad means and which anchors the resilient pad means between the bearing surface and the track rail plate in order to prevent pad material from being ripped from the track rail plate, the anchor means being a plurality of angle bars embedded in the resilient pad means and being affixed to the rail plate along each edge thereof, only said angle bars being embedded in the resilient pad means and being adapted to anchor edges of the resilient pad means to the edges of the rail plate and further to shield said edges of the resilient pad means from certain ripping and tearing forces applied thereto during use, the angle bars comprising an elongated strip of metal which is folded along a seam into a first side and a second side, the first side of each angle bar being affixed along a. edge of the rail plate which is common with an edge of the resilient pad means, the first side extending upwardly and inwardly away from the track rail plate and the second side extending downwardly and inwardly towards the track rail plate;

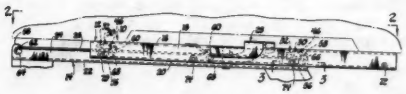
means for enabling the padded rail plate to be affixed to a track including a plurality of apertures in the resilient pad aligned with a plurality of apertures in the rail plate, said apertures adapted to receive a stud portion of a bolt therethrough.

4,588,234

BEARING ASSEMBLY FOR SEAT SLIDE STRUCTURES

Richard W. A. Rees, West Bloomfield, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 8, 1985, Ser. No. 709,881
The portion of the term of this patent subsequent to Apr. 16, 2002, has been disclaimed.
Int. Cl.[4] F16C *29/04*
U.S. Cl. 308—3.8 **1 Claim**



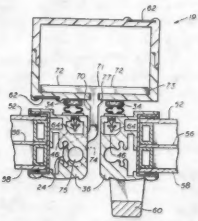
1. A seat slide comprising, a pair of generally U-shaped track members, one track member including a base wall, a pair of side walls and a terminal flange extending from each of the side walls, the other track member including a base wall opposed to the one base wall, a pair of side walls, each located in opposed spaced relationship to a respective side wall of the one track member, and a terminal flange extending from each of the side walls and located in opposed spaced paired relationship to a respective terminal flange of the one track member, bearing means located between the opposed paired terminal flanges, a flexible elongate cylindrical bearing roller located transversely of the track members between the base wall of the one track member and the terminal flanges of the other track member, said bearing roller including roller end portions rotatably engageable with the terminal flanges of the other track member and with the base wall of the one track member to bias the track members apart relative to each other and engage the bearing means with the opposed paired terminal flanges, each terminal flange of the other track member including a spaced pair of arcuate shoulders formed integrally therewith and defining the extent of rolling movement of the bearing roller relative to the other track member, each side wall of the other track member being provided with a spaced pair of shoulders formed integrally therewith and defining the extent of movement of the bearing means relative to the one track member whereby both the bearing means and the bearing rollers have predefined extents of movement relative to the one and the other track members.

4,588,235

REFRIGERATOR DOOR STRUCTURE

Louis F. Barroero, 1585 Daniels Dr., San Leando, Calif.

Filed Sep. 7, 1984, Ser. No. 648,378
Int. Cl.[4] A47F *3/10*
U.S. Cl. 312—138 R **14 Claims**



1. A fiberglass refrigerator door structure attachable to an opening in a refrigerator compartment, said structure comprising, as a composite;

(a) a mounting frame including an opening therein for entry

into said refrigerator compartment and being of a size slightly less than that of the surfaces bounding said opening in said refrigerator compartment, said mounting frame having two vertically disposed side members held at equally-spaced relation by top and bottom end members, said side members being formed of two U-shaped channel members appropriately fastened together, and said top and bottom end members detailing a general "L" configuration while having generally U-shaped flanges extending along the entire length of their vertically projecting terminal ends, and

(b) a door hingedly connected to said mounting frame, said door being of a width slightly less than that of said mounting frame while being of a size sufficient to completely cover said opening in said mounting frame.

4,588,236

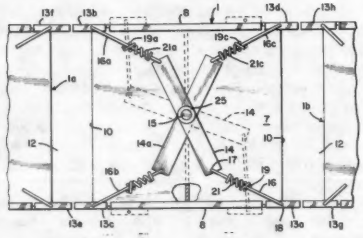
ROTARY FILE CABINET

Frank Potter, 270 Adams Blvd., Farmingdale, N.Y. 11735

Filed Mar. 2, 1984, Ser. No. 585,391

Int. Cl.[4] A47B *49/00*

U.S. Cl. 312—201 **2 Claims**



1. A rotary file cabinet comprising a base having an upper member rotatable relative to a lower stationary member; and a file cabinet mounted upon the upper member for rotation with the latter, the file cabinet having a top member of quadrate form and two opposed side walls of rectangular form, one of which side walls depends vertically from one side edge of the top member and the other of which depends vertically from an opposite side edge of the top member, the side walls being fixed at their bottom ends to the upper member of the base, and the side walls defining between them a pair of opposed open sides to the file cabinet allowing access to the interior of the file cabinet; wherein each side wall is narrower in width than the related side edge of the top member; a separate door is hinged to each vertical side edge of each side wall; each door in a closed position has a condition in which it extends laterally beyond the top member and is coplanar with the related side wall; and each door in an open position has a condition in which it overlaps an outer face of the related side wall; the file cabinet being adapted to be disposed in a row with and in a predetermined spaced relation to similar neighboring cabinets, the spacing being such that the doors of the file cabinet in their closed position close over approximately one-half of the spacing and present a continuous wall appearance with neighboring cabinets having the same condition of their doors, and in the open position of the doors of the file cabinet the said spacing being such as to enable the file cabinet to be rotated clear of the neighboring cabinets so as to present its open sides to a user; wherein each door is manually turnable on its hinges from one position to the other; wherein a first lever means operatively connects a first one of the doors of one side wall of the cabinet with a diagonally located door of the other side wall of the cabinet, the first lever means comprising a pivot shaft fixed axially of the top member, a first lever centered on the pivot shaft, a lever actuating rod pivoted at one end to the lever and pivoted at its opposite end intermediately of a top end of the first one of the doors, a guide through which the rod passes and by which the rod is guided for movement, the guide having a fixed position on the top member, a second lever actuating rod similarly associating an opposite end of the lever with the diagonally located door, the first lever means being responsive to manual turning of one of the connected doors in a selected direction to effect a corresponding directional turning of the other connected door; and wherein a second similar lever means is mounted upon the pivot shaft and similarly associates a second one of the doors of one side wall of the cabinet with a diagonally located second door of the other side wall of the cabinet, and the second lever means being responsive to manual turning of one of the second doors in a selected direction to effect a corresponding directional turning of the other connected second door.

4,588,237

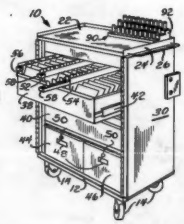
APPARATUS AND METHOD FOR DISPENSING MEDICINE

Herbert B. Marder, 177 Lakewood Place, Highland Park, Ill. 60035

Filed Feb. 2, 1984, Ser. No. 576,441

Int. Cl.[4] B01L *9/02*

U.S. Cl. 312—209 **4 Claims**



1. A cart for use in dispensing medications to a plurality of patients comprising a base, wheel means on said base for moving said cart about, means upstanding from said base and slidably supporting at least one drawer, said drawer having a pair of parallel side walls interconnected by a transverse front wall and having front-to-back divider means parallel to and spaced from said side walls and dividing said drawer into a plurality of storage areas and holding a plurality of patient cards and respective medicine cards, and holder means disposed on top of said divider means and having a plurality of recesses shaped and sized for respectively receiving disposable medication dispensing containers respectively having preselected medications therein, and a patient name card support adjacent each said recess for receipt of a patient name card with said patient name cards and medicine dispensing containers proximate to said patient cards and medicine cards in said storage areas, and means slidably mounting said holder means on said divider means for permitting slidable movement of said holder means forwardly of said drawer front wall.

4,588,238

TELEPHONE NETWORK INTERFACE CONNECTOR

N. Peter Mickelson, Gorham, and John J. Napiorkowski, Cape Elizabeth, both of Me., assignors to GTE Products Corporation, Stamford, Conn.

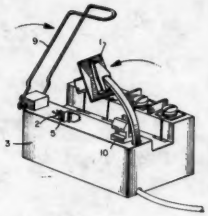
Filed Dec. 19, 1984, Ser. No. 683,739

Int. Cl.[4] H01R *13/62*

U.S. Cl. 339—91 R **4 Claims**

1. A telephone interface connector comprising: an RJ11C modular plug; an RJ11C jack, in a jack housing, into which the RJ11C modular plug is inserted; metal contacts on the RJ11C modular plug for making electrical contact with matching metal contacts in the RJ11C jack when the plug is inserted into the jack; a mating surface on the plug which mates with a

corresponding mating surface on the jack, there being a small gap between the two mating surfaces when the plug is inserted into the jack; a resilient sealing member in the gap for environmentally sealing the contacts; means for maintaining the resilient sealing member in compression when the plug is inserted into the jack; the metal contacts of the plug being connected to wires which exit the plug through a hole which is environmentally sealed with an encapsulant; the metal contacts of the jack being connected to wires which exit the jack housing through a hole which is environmentally sealed with an encapsulant;



the combination of the resilient sealing member and the encapsulants providing environmental protection for the connector, said means for maintaining the resilient sealing member in compression being readily disengageable; the relationship of the RJ11C plug and the RJ11C jack being such that when said means is disengaged, said RJ11C plug can be readily unplugged and another RJ11C plug connected to a telephone can be inserted into said jack for the purpose of testing the telephone, said original RJ11C plug remaining fastened to the telephone interface connector while unplugged from the jack.

4,588,239

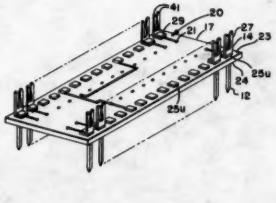
PROGRAMMED SOCKET

John T. Venaleck, Madison, Ohio, assignor to 4C Electronics, Inc., Mentor, Ohio

Continuation of Ser. No. 471,280, Mar. 2, 1983,. This application Apr. 4, 1985, Ser. No. 719,638

Int. Cl.[4] H01R *31/06, 9/09, 13/504*

U.S. Cl. 339—17 CF **8 Claims**



4. A programmed socket device for enabling usage of a substitute integrated circuit package with an electrical circuit component designed for plug-in connection at terminal connectors thereof with terminal members of another integrated circuit package where such substitute and another integrated circuit packages have functionally related terminal members located at different positions in respective terminal patterns, comprising:

a generally planer support having opposite sides;

plural first electrical contacts mounted on one side of said support in a prescribed pattern corresponding to the terminal pattern of such another integrated circuit package and projecting outwardly from said one side for plug-in connection with the terminal connectors of such electrical circuit component;

plural second electrical contacts mounted on the other side of said support in a prescribed pattern corresponding to the terminal pattern of such substitute integrated circuit package and projecting outwardly from said other side for plug-in connection with the terminal members of such substitute integrated circuit package; and

electrically conductive means positioned with respect to said support to electrically couple respective first electrical contacts with respective second electrical contacts for establishing electrical paths from terminal members of such substitute integrated circuit package to functionally related but differently located terminal connectors of such electrical circuit component.

4,588,240

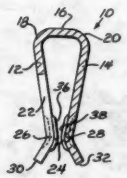
BRIDGING CLIP

William E. Ruehl, 316 Surrey Rd., Wheeling, Ill. 60090, and Edwin G. Swick, 28W629 Stearns Rd., Bartlett, Ill. 60103

Continuation of Ser. No. 552,551, Nov. 16, 1983, abandoned. This application Jul. 17, 1985, Ser. No. 755,965

Int. Cl.[4] H01R *31/08*

U.S. Cl. 339—19 **5 Claims**



1. A bridging clip comprising an integral formed sheet metal member comprising a bight and a pair of legs converging from said bight to confronting inflection areas and thereafter diverging, the intersection of the converging portion of each leg with the diverging portion defining a bend line generally parallel with said bight, an integral elongate continuously curved rib formed on each of said legs with a V-shape cross section and extending transversely across said confronting inflection areas, said ribs having a criss-cross ninety degree orientation with respect to each other and having a point of intersection in said confronting inflection areas, said confronting area of said legs being spaced apart in the unflexed condition to provide an open space between said ribs, the angle between said ribs and said bend line on each leg being forty-five degrees.

4,588,241

SURFACE MATING COAXIAL CONNECTOR

Frank J. Ardezzone, Santa Clara, Calif., assignor to Probe-Rite, Inc., San Jose, Calif.

Filed Sep. 23, 1983, Ser. No. 535,244

Int. Cl.[4] H01R *11/00*

U.S. Cl. 339—59 M **15 Claims**

1. A surface mating coaxial connector, comprising:

a microcoaxial cable including at least a hollow cylindrical conductive shield means, insulated from a cylindrical central conductor by a dielectric material;

a contact pin having a right cylindrical proximal end and a hemispherical distal end;

an axially movable connection means through which said central conductor and the contact pin are mechanically and electrically connected such that axial motion of the contact pin in the direction of the central conductor is possible when an axial force is exerted on the contact pin and such that the contact pin returns to its original position when such force is removed, the axially movable connection means comprising a right cylindrical connector pin having a flat proximal end including an aperture for receiving said central conductor in an abutting manner and a flat distal end which abuts and is mechanically and

electrically connected to a first end of an interconnect bellows, a second end of said interconnect bellows abutting and being mechanically and electrically connected to a flat proximal end of the contact pin;

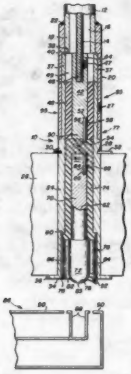
a hollow right cylindrical shield collar coaxial with and surrounding a distal end of the contact pin, but electrically insulated therefrom, said collar being resiliently compressible in an axial direction such that axial motion of the collar, independent of any axial motion of the contact pin, is possible when axial force is exerted on the shield collar, the shield collar including a conductive shield extension means formed thereto for maintaining an electrical contact with the shield collar during axial motion thereof;

an insulating means in contact with said dielectric material and electrically insulating said shield extension means and shield collar from the central conductor, the axially movable connection means and the contact pin, said flat abutting surfaces of said central conductor, the axially movable connection means and the contact pin being substantially perpendicular to an axis of motion of the axially movable connection means such that the transmission impedence to a signal traveling from the central conductor through the axially movable connection means and to and through a terminal end of the contact pin remains substantially the same as the coaxial cable, said insulating means including an elastomer core surrounding said axially movable connection means and a portion of the contact pin such that axial force applied to the contact pin is transmitted to the elastomer core which can be resiliently compressed permitting axial movement of the contact pin;

whereby the contact pin may be brought into contact with the surface with which it is desired to transmit signals through the contact pin to devices, circuits, components or other items electrically connected to the surface with which contact is made;

the contact pin is electrically shielded by the shield collar to minimize interference from electrical noise sources proximate to the contact pin; and

a transmission impedence of the connector is substantially the same as that of the coaxial cable such that the impedence of the surface with which the contact is made may be matched to that of the connector resulting in substantially elimination of signal reflection due to impedance mismatch.

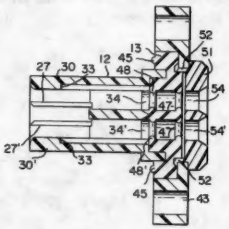


4,588,242

SEALED ELECTRICAL CONNECTOR

Paul W. McDowell, Mechanicsburg, and Wilfred R. Scheller, Camp Hill, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jul. 6, 1983, Ser. No. 511,079
Int. Cl.[4] H01R *11/00*
U.S. Cl. 339—59 M **5 Claims**



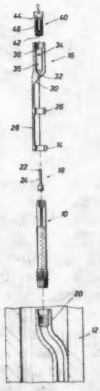
1. An electrical connector housing comprising a shell defining walls of terminal receiving passageways communicating with a rear, wire receiving face and a front, mating face and elastomeric material moulded in a rear portion of the shell, the shell having a peripheral flange extending transversely of the rear portion and formed with a cavity opening to the mating face, the cavity and the rear portion intercommunicating, the elastomeric material in the cavity and in the rear portion constituting a unitary sealing member to provide wire receiving extensions of the passageways of restricted size for sealing engagement with the wires and to provide a seal surrounding the passageways.

4,588,243

DOWNHOLE SELF-ALIGNING LATCH SUBASSEMBLY

Mark S. Ramsey, Spring, and Joseph W. Stolle, Wharton, both of Tex., assignors to Exxon Production Research Co., Houston, Tex.

Filed Dec. 27, 1983, Ser. No. 565,449
Int. Cl.[4] H01R *13/20*
U.S. Cl. 339—65 **28 Claims**



1. A downhole latch subassembly comprising:

a male probe having a mounting end adapted to allow mounting said probe in a drill pipe, a connector end adapted to mount a male electrical connector, said probe

having a longitudinal passageway between said mounting end and said connector end,

a male electrical connector adapted to mount in said connector end of said male probe,

a female mating piece having an overshot section and an electrical connector receiver section,

said overshot section comprising two rings spaced a distance apart from each other and from the electrical connector receiver section, said rings adapted to receive said male probe and control passage of a male electrical connector through a path leading directly into a connector receiver orifice in said electrical connector receiver section,

said electrical connector receiver section having a connector receiver orifice passing through a surface sloping with respect to the path of said male electrical connector mounted in said male probe and forming one end of said receiver section, said orifice facing said rings and opening into a receiver chamber positioned away from said rings, said receiver chamber including at least one debris exit port spaced away from said connector receiver orifice, said chamber adapted to receive a female electrical connector therein and having means for securing said female electrical connector therein, and

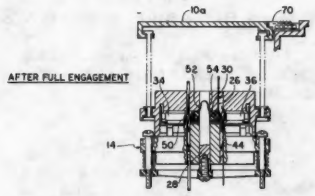
a female electrical connector mounted within said receiver chamber and adapted to accept said male electrical connector through said connector receiver orifice.

4,588,244

LINEAR ACTUATED CONNECTOR

John W. Anhalt, Orange, and George R. Deacon, Corona Del Mar, both of Calif., assignors to ITT Corporation, New York, N.Y.

Filed Jan. 14, 1985, Ser. No. 690,915
Int. Cl.[4] H01R *13/631*
U.S. Cl. 339—75 M **6 Claims**



1. A system for enabling the sliding insertion of an insertable electrical circuit assembly into engagement with an inplace assembly that lies in a housing, so the multiple electrical terminals in each assembly make secure contact with each other, comprising:

a housing;

first and second assemblies, each having a multiplicity of contact terminals, one of said assemblies being an insertable assembly and the other being an inplace assembly, said inplace assembly being movable within said housing;

means for guiding the insertable assembly in sliding movement along a first direction toward and substantially against the inplace assembly, said contacts on each assembly lying adjacent and opposite each other but out of contact when said assemblies are first brought against each other, said inplace assembly being moveable by movement of said insertable assembly after said assemblies are substantially against each other;

the first of said assemblies having a terminal-deflecting member with multiple terminal-engageable portions and a cam follower which can slide in a second direction that is largely perpendicular to said first direction to push said terminal-deflecting member so its terminal-engaging portions deflect a plurality of the terminals of said first assembly in said second direction towards terminals of the second assembly; and

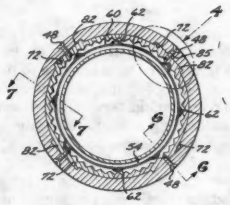
a cam coupled to said housing, which engages said cam follower and pushes it in said second direction when said insertable assembly moves further along said first direction, after reaching a position at which said terminals in said assemblies lie adjacent and opposite but out of contact, to deflect a plurality of said terminals of said first assembly into engagement with terminals of said second assembly.

4,588,245

SELF-LOCKING COUPLING NUT

Lawrence Schwartz, Huntington Beach, and Jerry T. Steele, Fountain Valley, both of Calif., assignors to Flight Connector Corporation, Rancho Dominguez, Calif.

Filed Aug. 23, 1984, Ser. No. 643,424
Int. Cl.[4] H01R *13/623*
U.S. Cl. 339—89 R **21 Claims**



1. An electrical connector having an outer shell and adapted to be secured to a mating electrical connector member comprising:

a flange member comprising first and second flanges, said first and second flanges extending around the circumference of said shell to form an annular groove therebetween, the bottom portion of said groove comprising first and second edge portions and a channel formed between said first and second edge portions;

a ring member having inner and outer circumferences, a plurality of ratchet teeth projecting from the inner surface of said ring member, a plurality of apertures formed through said ring member, said ring member being positioned in said annular groove;

a coupling nut adapted to engage said outer shell and said mating electrical connector member, a portion of the outer surface of said coupling nut having a plurality of apertures formed therethrough and arranged to be aligned with corresponding apertures formed in said ring member; and

means passing through said aligned apertures for joining said coupling nut to said ring member whereby said coupling nut is prevented from slipping off said electrical connector.

4,588,246

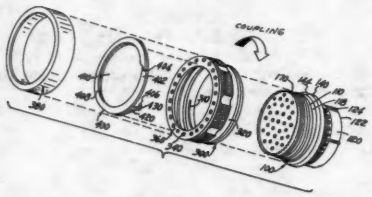
ANTI-DECOUPLING MECHANISM FOR AN ELECTRICAL CONNECTOR ASSEMBLY

Alan L. Schildkraut, Sidney, and Robert W. Brush, Sr., Unadilla, both of N.Y., assignors to Allied Corporation, Morristown, N.J.

Division of Ser. No. 493,535, May 11, 1983, Pat. No. 4,525,017.
This application Feb. 4, 1985, Ser. No. 698,285
The portion of the term of this patent subsequent to Jun. 25, 2002, has been disclaimed.
Int. Cl.[4] H01R *13/623*
U.S. Cl. 339—89 R **2 Claims**

1. A clutch spring for resisting two direction relative rotation between a connector shell and a coupling nut, said cou-

pling nut being rotatably mounted to the shell and having a plurality of engagable detents, said clutch spring comprising a flat leaf of generally rectangular cross-section having opposite ends and formed into a helical coil the inner diameter of which is sized to circumpose and normally immovably frictionally engage about said shell with one and the other said end thereof, respectively, being free and including a lock arm cantilevered therefrom adapted to engage successive of said detents whereby to resist both coupling and uncoupling rotation, said leaf having the long dimension of its cross-section extending radially and the leaf when coiled defining a frusto-conical



spring which is adapted to axially bias said coupling nut, said lock arm extending generally tangentially from the coil to terminate in a terminal portion adapted to fit respective of said detents to resist both coupling and uncoupling rotation, coupling rotation requiring the terminal portion to radially expand the coil and uncoupling rotation requiring first that the terminal portion be forced against its detent whereby to drive the lock arm radially inward to place a winding torque on the coil and second that the terminal portion cam the lock arm axially rearwardly and outwardly from engagement with its detent so that the lock arm may advance into engagement with another detent.

4,588,247

ELECTRIC CONNECTORS INTENDED PARTICULARLY TO BE USED IN A LIQUID MEDIUM PARTICULARLY UNDER PRESSURE

René Grappe, Paris, and Pascal Martin, Le Pre Saint Gervais, both of France, assignors to Souriau & C., Billancourt, France

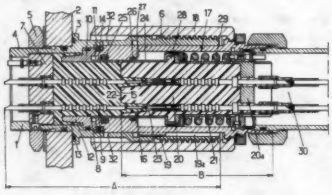
PCT No. PCT/FR83/00098, § 371 Date Jan. 19, 1984, § 102(e) Date Jan. 19, 1984

PCT Filed May 19, 1983, Ser. No. 576,371

Claims priority, application France, May 19, 1982, 82 08831

Int. Cl.[4] H01R *13/62*

U.S. Cl. 339—94 M **5 Claims**



1. An electrical connector, particularly intended to be used in a liquid medium over a long time period, comprising first and second connector elements adapted to be removably coupled together within the liquid medium in a first, connected position thereof;

said first connector element including a plurality of male electrical contacts which are supported in a corresponding insulating body and which are partially surrounded with truncated cone shaped bosses projecting a substantial distance outwardly from the front face of the corresponding insulating body;

said second connector element including a like plurality female electrical contacts which are supported in a corresponding insulating body and which open at the bottom of a like plurality of truncated cone shaped recesses formed in the front face of the corresponding insulating body;

resilient means provided in at least one connector element and disposed in relationship with respect to the corresponding insulating body of that connector element so as to continuously push the corresponding insulating body forward;

first and second cylindrical rigid sleeves respectively provided around at least the front parts of said insulating bodies of said first and second connectors, said sleeves having substantially the same transverse dimensions and being so axially positioned that, in the connection position of the two connector elements, the sleeves are in substantially end to end relationship;

one of said connector elements including a ring disposed so as to surround the corresponding sleeve of that connector element and being axially movable under control of a control means, said ring including two internal annular seals and said seals being spaced axially apart from each other by such a distance that, and the axial travel of said ring being such that, when the connector elements are not coupled together and thus the insulating body of the connector element including the ring is retracted into that connector element, both said annular seals surround only the corresponding sleeve of that connector element whereas, when the two connector elements are coupled together and thus the insulating body of the connector member including the ring is in the connection position, said ring overlaps the front parts of the sleeves of both connector elements and the two annular seals surround respective ones of the two sleeves on each side of the interface between the

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4,588,248

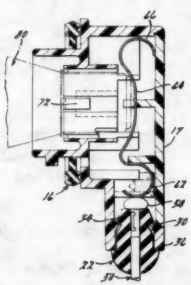
SOCKET

Marvin W. Moore, Oxford, Mich., assignor to Microdot Inc., Darien, Conn.

Filed Jan. 30, 1985, Ser. No. 696,504

Int. Cl.[4] H01R *4/00*

U.S. Cl. 339—94 L **1 Claim**

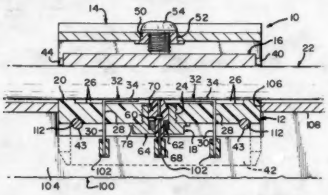


1. A socket for the reception of a bulb comprising a housing, an elongated cylindrical aperture in said housing having laterally extending shoulders at opposite ends thereof, a resilient tensioned grommet in said aperture having a central bore and end portions engageable with said laterally extending shoulders in sealing relationship, an electrically conductive wire extending through the central bore of said grommet, and a terminal strip in said housing having a deflectable flat portion lying in a plane extending at a right angle to a central axis of said bulb and engageable therewith, said terminal having an arcuate end portion engageable with said wire and wipable thereagainst upon insertion and removal of said bulb.

4,588,249
COAXIAL CABLE TAP CONNECTOR

Charles S. Blichasz; David H. Gutter, and George W. Michael, III, all of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 3, 1982, Ser. No. 439,240
Int. Cl.[4] H01R *4/24*
U.S. Cl. 339—97 P **21 Claims**



1. A coaxial cable tap connector of the type for electrical connection to the outer and center conductors of a coaxial cable which comprises first and second matable members securable together and each having a channel for engagement with the cable, an outer conductor contact member for penetration through an outer jacket of the cable for electrical connection with an outer conductor of the cable when the matable members are secured together, and a spring-biased signal probe contact member connector for electrical connection with a center conductor of the cable, characterized in that,

the second matable member contains a clamp member having said channel therealong, a member in said second matable member moves said clamp member into clamping engagement with the cable causing the outer conductor contact member to penetrate through the outer jacket and electrically connect with the outer conductor;

said spring-biased signal probe contact member is part of a signal probe assembly including a threaded bolt carrying said spring-biased signal probe contact member, said threaded bolt being matable with a threaded hole in one of said matable members to rotatably drive said spring-biased signal probe contact member through the outer jacket and outer conductor, into an insulation sheath and into electrical connection with the center conductor.

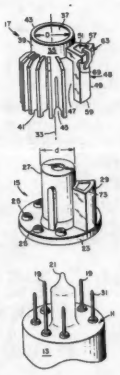
4,588,250
CONNECTIVE-PROTECTIVE ADAPTER FOR A CRT BASE

Peter G. Puhak, and Charles H. Rehkopf, both of Seneca Falls, N.Y., assignors to North American Philips Consumer Electronics Corp., New York, N.Y.

Filed Oct. 3, 1983, Ser. No. 538,621
Int. Cl.[4] H01R *33/74*
U.S. Cl. 339—144 T **6 Claims**

1. A connective-protective adapter for use with a cathode ray tube including a closure portion having a sealed exhaust tubulation, and an annular array of exteriorly protruding connector pins surrounding the tubulation, the tube also including a base, said base formed to seat on the closure portion, and having a circular flange-like seating member surrounding a central hollow cap-like portion oriented to enclose the tubulation, the seating member having an annular array of connector pin accommodating apertures, at least one of said connector pin apertures being isolated by a tubular isolation structure formed as an integral upstanding part of said base and having a length exceeding that of the isolated connector pin;

the adapter being a crown-like structure with a longitudinal axis there through comprising; a substantially cylindrical wall member having interior and exterior surfaces with proximal and distal ends defining a cavity having a length exceeding the length of said base isolation structure, said cylindrical wall member being formed to slidingly encompass the cap-like portion of said base in a frictionally engaging manner, whereby the proximal end thereof abuts the seating member of said base; a plurality of longitudinal ridges spaced apart on the exterior surface of the cylindrical wall member to form a plurality of open longitudinal channels to individually accommodate said tube connector pins in an exposed protective environment; said cylindrical wall member defining a slot to spatially straddle the tubular isolation structure of said base; a longitudinally projecting component integrally attached to the region of the distal end of said wall member and extending in a spaced manner past said slot toward said proximal end, said projecting component including a tubular element formed to compatibly fit into the tubular isolation structure of the base, said tubular element defining a cavity

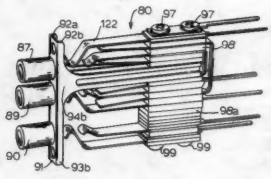


having forward and rearward wall portions, an open distal end, and a proximal end defining an aperture there through to accommodate said isolated connector pin; a resilient electrical connective element positioned within the cavity of said tubular element to provide pressured contact with the isolated connector pin, said connective element being affixed to the distal end of said projecting component in an exposed manner to provide external electrical contact for the isolated connector pin, characterized in that said projecting component has an outwardly protruding ledge located at the distal end of said tubular element, the ledge formed to seat on and slightly outstand from the distal end of said tubular isolation structure of said base when said adapter engages said base.

4,588,251
TELEPHONE JACK ASSEMBLY

George W. Newton, Durham, N.C., assignor to Trimm, Inc., Libertyville, Ill.

Filed Apr. 22, 1985, Ser. No. 725,893
Int. Cl.[4] H01R *13/50*
U.S. Cl. 339—182 R **8 Claims**



1. A telephone jack assembly, comprising:

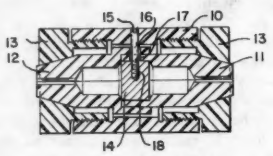
(a) a metal jack frame having:
(i) a rectangular face plate;
(ii) a selected number of first openings in said face plate for receiving a comparable number of jack bushings;
(iii) a pair of side arms disposed at a right angle to and formed integral with said face plate;
(iv) a centrally-located rib formed in and extending lengthwise of each said arm and extending toward the rib formed in the opposite said arm thereby providing a pair of inwardly-directed opposed said ribs between said arms;
(v) a selected number of second openings in said face plate each being adapted for receiving a fastener to secure the assembly to a jack panel; and
(vi) flange portions disposed at right angles to and formed integral with said face plate on each side thereof and residing in the plane of said arms, said arms forming continuations of said flange portions;
(b) a selected number of bushings equal to the said selected number of first openings secured to said face plate and extending outwardly therefrom in right angle relation; and
(c) spring platform means mounted between said arms and comprising metal block structure having side faces corresponding to the shape of the inner faces of said arms above and below said ribs, said metal block structure being integrally secured to said arms at the juncture of said faces and having threaded holes for receiving screws to secure a spring/insulator assembly.

4,588,252

ELECTRODE EXTENSION HOLDERS

Roger L. Ice, R.D. #2, Box 121F, Smithfield, Pa. 15478

Filed Dec. 31, 1980, Ser. No. 221,531
Int. Cl.[4] H01R *7/06*
U.S. Cl. 339—268 R **9 Claims**



1. An electrode extension connector for connecting two flux coated welding rods together in end to end relationship comprising a housing of generally cylindrical cross section and of electrical and heat insulative material, a block of electrically conductive material intermediate the ends of said housing adapted to abut the end of an electrode inserted in each end of said housing and a thermally and electrically insulative chuck means in each end of said housing for selectively detachably and removably engaging and gripping an uncoated welding electrode end in contact with said block of electrically conductive metal.

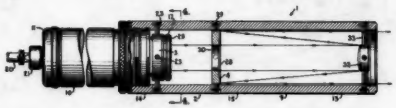
4,588,253

INFRARED COLLIMATOR

Amber N. Brunson, Independence, Mo., assignor to Brunson Instrument Company, Kansas City, Mo.

Filed May 23, 1984, Ser. No. 613,304
Int. Cl.[4] G02B *27/30*
U.S. Cl. 350—1.1 **2 Claims**

1. An infrared collimator comprising:
(a) a barrel housing having front and rear end portions;
(b) an infrared energy emitting source mounted in the rear end portion of said barrel;
(c) a mask over said source, said mask having apertures therethrough to produce a reticle beam pattern;
(d) a mirror assembly including:
(i) a concave concentrator having a central through bore and mounted coaxially in said barrel; and
(ii) a convex reflector mounted coaxially in said barrel and sized approximately equal to said through bore;
(e) whereby infrared energy in said reticle beam pattern is reflected respectively by said concave concentrator and



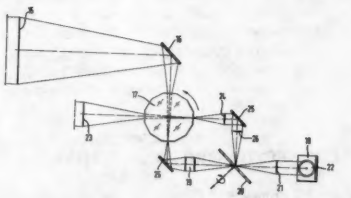
said convex reflector and directed outwardly in a coherent, collimated beam through said barrel;
(f) said source being an automatic temperature controlling unit having a resistance heated surface plate maintained at an adjustable differential with respect to a second reference temperature.

4,588,254

METHOD EMPLOYING OPTICAL/MECHANICAL APPARATUS FOR SCANNING TWO FIELDS OF VIEW

Josef F. Menke, Glücksburg, and Günter Zeifang, Neckargemünd, both of Fed. Rep. of Germany, assignors to EGO Entwicklungsgesellschaft für Optronik mbH, Glücksburg, Fed. Rep. of Germany

Filed Feb. 24, 1984, Ser. No. 583,252
Claims priority, application Fed. Rep. of Germany, Mar. 3, 1983, 3307484
Int. Cl.[4] G02B *26/10*
U.S. Cl. 350—6.7 **4 Claims**



3. Apparatus for scanning two fields of view by optical/mechanical means, in two scanning directions which are disposed essentially at right-angles to one another, and for simultaneously displaying these fields of view, said apparatus utilizing two optical/mechanical scanners for performing one scanning process, in a line direction, which is performed rapidly and another scanning process, in a vertical direction, which is performed slowly using only one detector or one detector array wherein said apparatus operates with a line scanning efficiency which does not exceed 50% for both fields of view and there is a 180° phase shift between said scanning processes respectively applied to the two fields of view, said apparatus comprising: two unpaired scanning devices, a disc and a first objective, said disc possessing reflecting segments and transparent segments in alternation rotating in an intermediate image which is located in front of an image scanning device and allowing radiation from the two fields of view to reach the detector, in alternation via said first objective; a first path-folding mirror; a refractive polygon which performs said one line scanning process; a second path-folding mirror; a second objective; and a lens system.

4,588,255

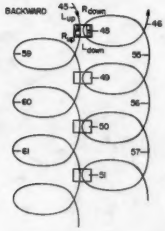
OPTICAL GUIDED WAVE SIGNAL PROCESSOR FOR MATRIX-VECTOR MULTIPLICATION AND FILTERING

Moshe Tur, Palo Alto; Joseph W. Goodman, Los Altos; Herbert J. Shaw, Stanford; Behzad Moslehi, Stanford, all of Calif., and John E. Bowers, Milltown, N.J., assignors to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Continuation-in-part of Ser. No. 390,664, Jun. 21, 1982, abandoned. This application Jun. 13, 1983, Ser. No. 503,871

Int. Cl.⁴ G02B *6/28;* G06G *7/12*

U.S. Cl. 350—96.16 **55 Claims**



28. An optical signal processor comprising:

a first optical waveguide having a first end portion for receiving input optical signals and a second end portion, said first waveguide defining a first optical path for transmission of said input optical signals in a first direction from said first end portion to said second end portion;

a second optical waveguide having a first end portion for outputting output optical signals and a second end portion, said second waveguide defining a second optical path for transmission of optical signals in a second direction from said second end portion to said first end portion, said waveguides oriented such that said second direction is substantially opposite to the first direction;

a plurality of coupling means for optically coupling said input signals from said first waveguide to said second waveguide at discretely spaced intervals along said waveguides to provide said output signals, said coupling means locally orienting said first and second optical paths at said discrete intervals such that said input and output signals in said first and second optical paths travel in the same direction at said intervals, thereby causing the input optical signals propagating in said first direction in said first waveguide to be coupled from the first optical path into the second optical path so as to travel in said second direction in said second waveguide to provide said output signals;

a light source optically coupled to the first end portion of said optical waveguide for transmitting optical signals into the first optical path in said first direction; and

means optically coupled to the first end portion of said second optical waveguide for detecting optical signals from the second optical path traveling in said second direction.

54. A method for processing optical signals comprising the steps of:

providing a first optical fiber;

connecting a plurality of optical couplers to the first optical fiber, said plurality of optical couplers representing an N by N matrix, and each of the plurality of optical couplers having a coupling ratio which represents an element of the N by N matrix;

connecting a second optical fiber to the plurality of optical couplers, said second optical fiber having an output end;

introducing a sequence of optical pulse signals into the first optical fiber, each of said optical pulse signals being representative of a component of a vector;

coupling portions of the optical pulse signals from the first optical fiber through the plurality of optical couplers into the second optical fiber thereby providing in said second optical fiber a sequence of output pulses representing elements of a product of multiplication of the N by N matrix and the vector; and

propagating the output pulses in the second optical fiber to the output end of said second optical fiber.

4,588,256

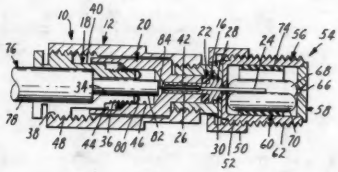
OPTICAL FIBER CONNECTOR

James R. Onstott, Beldenville, Wis.; Bryon J. Cronk, Hugo, and Thomas M. Cherney, St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 415,224, Sep. 7, 1982, abandoned. This application Apr. 19, 1985, Ser. No. 724,804

Int. Cl.⁴ G02B *6/38*

U.S. Cl. 350—96.21 **14 Claims**



1. A connector adapted for coupling an optical fiber cable which includes an outer jacket, a plurality of strain relief fibers, and an innermost optical fiber, said connector comprising a housing having a generally cylindrical cavity including front and rear openings and a strain relief assembly adapted to be received into said rear opening and to be secured thereat such that a portion of said strain relief assembly protrudes through the front opening of the housing, said strain relief assembly comprising:

(a) an optical fiber mounting means including a rear portion adapted to receive the optical fiber and a tubular member containing a hot melt adhesive which upon heating allows the optical fiber to be inserted therethrough and upon cooling anchors the fiber therein, which tubular member enables the member and fiber anchored therein to abut a like member and fiber in another connector,

(b) a rear strain relief member having an opening therethrough for receiving said optical fiber cable in the rear end thereof and including

(i) means for anchoring the outer jacket of the cable within the rear portion of the opening, allowing the remainder of the cable to pass therethrough, and

(ii) means on the outer surface for engaging said strain relief fibers of said cable,

(c) a front strain relief member having an opening therethrough and including

(i) means on the interior near the front end thereof for receiving and axially aligning therein said rear portion of said fiber mounting means,

(ii) means on the interior near the rear end thereof for receiving and axially aligning a center portion of said rear strain relief member and

(iii) interconnecting detent means cooperating with said engaging means of the rear strain relief member for receiving and anchoring therebetween said strain relief fibers of the cable and for positively coupling the two members together, while also providing a positive indication when the two members are fully engaged, and

(d) a resilient member adapted to fit between the front end of said front strain relief member and said fiber mounting means to allow limited rearward movement of the mounting means,

whereby the strain relief assembly allows limited rearward

movement of the fiber mounting means to prevent undue strain on an optical fiber anchored therein such as may occur upon contact of the mounting means with a similar member upon connection of said connector and allows external forces applied to said outer jacket to be transferred to the assembly via the anchored strain relief fibers and prevents such strain from being coupled to said optical fiber.

4,588,257

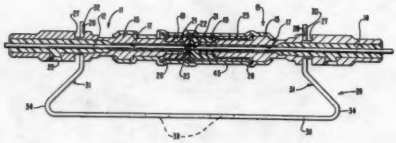
SEPARABLE SPLICE FOR OPTIC FIBERS

Jack J. Maranto, Capistrano Beach, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Oct. 24, 1983, Ser. No. 544,768

Int. Cl.[4] G02B *7/26*

U.S. Cl. 350—96.21 **7 Claims**



1. A separable splice for optic fibers comprising:

(a) a U-shaped spring clip having a pair of resilient arms extending from opposite ends of a central spine, each arm terminating in a pair of fingers, the fingers of each arm having a gap between them, fingers of one arm being spaced apart from fingers of the other arm, and

(b) a pair of pin-shaped fiber optic termini with means to maintain them engaged in axial alignment, even in the absence of said spring clip, each terminus having a shoulder transverse to its axis, said shoulders being spaced apart farther than the fingers of said arms, each terminus being inserted at its shoulder into the space between fingers of one of said arms so as to keep the arms of said clip flexed apart and said termini pressed toward each other.

4,588,258

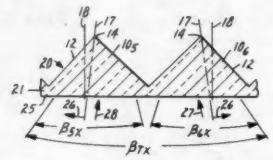
CUBE-CORNER RETROREFLECTIVE ARTICLES HAVING WIDE ANGULARITY IN MULTIPLE VIEWING PLANES

Timothy L. Hoopman, River Falls, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 531,349, Sep. 12, 1983, abandoned. This application Jul. 30, 1984, Ser. No. 634,111

Int. Cl.[4] G02B *5/122, 5/124*

U.S. Cl. 350—103 **8 Claims**



1. Retroreflective article comprising at least one matched pair of cube-corner retroreflective elements which are rotated 180° with respect to one another, the three mutually perpendicular lateral faces of each element being defined at their bases by linear edges that lie in a common plane, and the optical axes of each element of the pair being tilted towards one edge of that element, whereby the retroreflective angularity of the article is increased both in an X-axis plane that is perpendicular to said common plane and to said edge toward which an element is tilted, and in a Y-axis plane that is perpendicular to both the X-axis plane and the common plane.

4,588,259

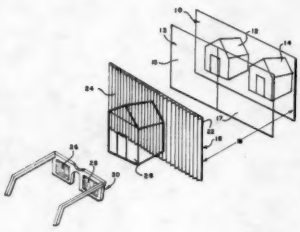
STEREOSCOPIC OPTICAL SYSTEM

David M. Sheiman, Los Angeles, Calif., assignor to Bright & Morning Star Company, Torrance, Calif., a limited partnership

Filed Jul. 31, 1984, Ser. No. 636,417

Int. Cl.[4] G02B *27/26, 27/22*

U.S. Cl. 350—132 **54 Claims**



1. A stereoscopic viewing and display system comprising:

(A) an imaging surface on which left and right stereoscopic images are displayed in adjacent array;

(B) light encoding means to encode said images with left and right image information;

(C) a thin face prism having one smooth surface and one faceted surface, said faceted surface comprising a plurality of straight, equally spaced individual prisms having a face angle from 25 to 135 degrees and spaced between 20 and 500 prisms per inch, and said thin face prism being positioned a distance in front of said imaging surface to fuse the right and left images; and

(D) an optical decoding filter medium for placement in front of an observer to decode said left and right stereoscopic images and confine the transmission of each of said left and right images to the respective left and right eye of said observer.

4,588,260

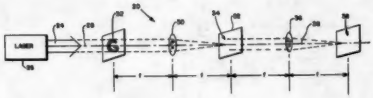
PHASE-ONLY OPTICAL FILTER FOR USE IN AN OPTICAL CORRELATION SYSTEM

Joseph L. Horner, Cambridge, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 3, 1984, Ser. No. 596,471

Int. Cl.[4] G02B *27/46;* G03H *1/16;* G06G *9/00*

U.S. Cl. 350—162.13 **10 Claims**



1. A method of producing a phase-only correlation filter comprising the steps of:

(a) generating preselected phase-only information by a fast Fourier Transform technique;

(b) transferring said phase-only information onto a nonexposed holographic film;

(c) developing said film; and

(d) bleaching said film, said bleached film capable of being used as a phase-only correlation filter having a phase

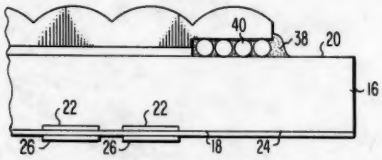
pattern representative of said preselected phase-only information.

4,588,261

IR-CCD IMAGER AND METHOD OF MAKING THE SAME

Harry G. Erhardt, Falls Township, Bucks County, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Jun. 7, 1984, Ser. No. 618,453
Int. Cl.[4] G02B *27/00*
U.S. Cl. 350—167 **13 Claims**



1. An imager comprising

a substrate of semiconductor material having a pair of opposed major surfaces and an array of detectors at one of said major surfaces,

a lenticular array including a substrate having a pair of opposed major surfaces and an array of lenses formed along one of said major surfaces, said lenticular array substrate having its other major surface in closely spaced relation to the other surface of the semiconductor substrate,

a bonding material between the other surfaces of said substrates only around the edge of the lenticular array substrate, said bonding material securing said substrates together, and

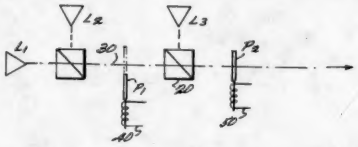
solid spacer means within said bonding means and engaging the other surfaces of said substrates to space them apart.

4,588,262

MULTI-LASER SWITCH

Roy D. Nelson, Lafayette, Colo., assignor to Ball Corporation, Muncie, Ind.

Filed Aug. 6, 1984, Ser. No. 637,806
Int. Cl.[4] G02F *5/30*
U.S. Cl. 350—401 **15 Claims**



1. A laser switching system having an output optical path and including a plurality of lasers each of which produces linearly polarized light, said switching system comprising:

means disposed in said output optical path for receiving linearly polarized light from said lasers and for passing said received laser light outwardly along said output optical path;

at least one beam rotating means for receiving linearly polarized light and passing same after rotation of its polarization vector by a predetermined angle; and

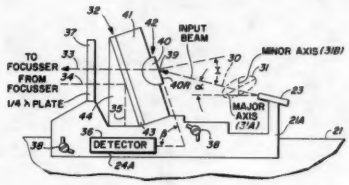
drive means for selectively moving said beam rotating means into and out of said output optical path.

4,588,263

AN ADJUSTABLE-OPTICAL PRISM WITH INTEGRAL-POLARIZING BEAM SPLITTER AND APPLICATIONS THEREOF

Donald K. Cohen, and Raymond Yardy, both of Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 2, 1984, Ser. No. 606,008
Int. Cl.[4] G02B *5/30, 5/04*
U.S. Cl. 350—401 **11 Claims**



1. An adjustable optical prism, having an integral polarizing beam splitter, including in combination:

an optical input member having a hemispheric shape and consisting of transparent material exhibiting given optical properties including a given index of refraction and having a convex output surface with a center of radius about a given point and an input surface, said input surface having a planar input portion at said center of radius;

an optical transmitting member having a concave hemispheric-shaped, outwardly-opening cavity with a center of radius about a given point located outside said optical transmitting member, the cavity being for movably receiving said optical input member such that said convex output surface engages said concave cavity for enabling said optical input member to pivot about said given point, an optical output surface on said optical transmitting member facing away from said concave cavity, and said optical transmitting member consisting of said transparent material exhibiting said given optical properties;

a light polarization sensitive means disposed on said output surface for transmitting light having a given polarization and reflecting light having other than said given polarization such that light received through said optical input member may be transmitted along a light path extending from said output surface through said light polarization sensitive means and for reflecting light impinging on said output surface received from said light path; and

a polarization adjusting member disposed in optical coupling relationship to said output surface and in said light path for adjusting the polarization of impinging light and for transmitting light transmitted from said optical input member and said optical transmitting member whereby adjustment of said optical input member with respect to said cavity adjusts the shape of any beam of light received thereon in accordance with the angle of said planar optical input portion with respect to the received beam of light.

4,588,264

MICROSCOPE OBJECTIVE LENS

Yoshiyuki Shimizu, Miura, Japan, assignor to Nippon Kogaku K. K., Tokyo, Japan

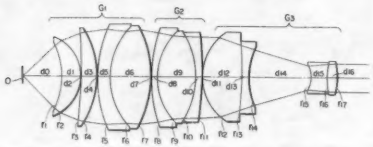
Filed Nov. 15, 1983, Ser. No. 551,842
Claims priority, application Japan, Nov. 30, 1982, 57-208652; Aug. 25, 1983, 58-155442
Int. Cl.[4] G02B *21/02*
U.S. Cl. 350—414 **7 Claims**

1. A microscope objective lens suitable for medium or high magnification having a great working distance and yet having an excellent imaging performance, comprising, in succession from the object side, a first lens group of positive refractive

power for converting a light flux from an object into a convergent light flux, said first lens group having at least one positive meniscus lens component having its concave surface facing the object side and a cemented lens component, a second lens group having a cemented lens component of small refractive power disposed in said convergent light flux, and a third lens group having a meniscus lens component having its convex surface facing the object side and a succeeding negative lens component, said objective lens satisfying the following conditions:

$$|r_1|>|r_2|>f \quad (1)$$

$$3f>\frac{1}{4}|r_1|>d_1 \quad (2)$$



$$d_F+d_A>d_R \quad (3)$$

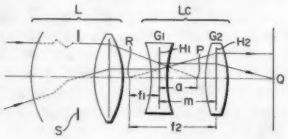
where r_1 and r_2 are the radii of curvature of the object side and image side lens surfaces, respectively, of the positive meniscus lens component in said first lens group which is most adjacent to the object side, d_1 is the center thickness of said positive meniscus lens component, f is the focal length of the entire system, d_F is the center thickness of the meniscus lens component in said third lens group which has its convex surface facing the object side, d_R is the center thickness of said negative lens component, and d_A is the air space between said meniscus lens component and said negative lens component.

4,588,265

TELECENTRIC REAR CONVERTER

Tomowaki Takahashi, Tokyo, Japan, assignor to Nippon Kogaku K. K., Tokyo, Japan

Filed Dec. 6, 1982, Ser. No. 447,932
Claims priority, application Japan, Dec. 14, 1981, 56-201362
Int. Cl.[4] G02B *13/22*
U.S. Cl. 350—415 **22 Claims**



1. In combination with a substantially telecentric objective lens, a telecentric rear converter mounted on the image side of the objective lens to make the composite focal length of said rear converter and said objective lens greater than the focal length of said objective lens while maintaining the telecentricity, said telecentric rear converter including:

a first lens unit of a negative refractive power; and

a second lens unit of a positive refractive power disposed on the image side of said first lens unit;

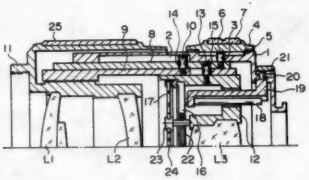
said two lens units being disposed so that the spacing between the principal points thereof is substantially equal to the difference between the respective absolute values of the focal lengths of said two lens units, said first lens unit having a rearward focus substantially coincident with the image point of said telecentric objective lens and converting a convergent light beam from said telecentric objective lens into a substantially parallel light beam, and said second lens unit converging the substantially parallel light beam while maintaining the telecentricity and forming an image at a predetermined back focal length position that is of a size different from the size of an image from said objective lens.

4,588,266

FILTER DEVICE FOR REFLEX OPTICAL SYSTEM ZOOM LENS

Shinsuke Komoto, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 10, 1981, Ser. No. 301,067
Claims priority, application Japan, Sep. 10, 1980, 55-128630[U]
Int. Cl.[4] G02B *5/22*
U.S. Cl. 350—439 **5 Claims**



1. A filter device for a reflex optical system zoom lens comprising:

a front group of lenses and a rear group of lenses which utilize a reflex optical system;

a rotatable turret comprising a filter frame holding a plurality of filters;

said turret provided between said front group of lenses and said rear group of lenses of a reflex optical system zoom lens;

a filter ring;

first gear means coupled to said turret and;

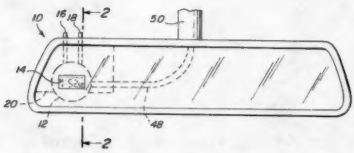
operating means responsive to movement of said filter ring to engage said gear means and rotate said turret as said filter ring is turned.

4,588,267

COMBINATION REAR VIEW MIRROR AND DIGITAL CLOCK

Ronald Pastore, 149 Heathcote Rd., Lindenhurst, N.Y. 11757

Filed Jan. 18, 1984, Ser. No. 571,820
Int. Cl.[4] G02B *5/08*; B60R *1/12*; G04B *47/02*
U.S. Cl. 350—600 **5 Claims**



1. A rear view mirror for use in motor vehicles comprising in combination a frame supporting a mirror with a grounded reflective silvered surface on the back of the mirror, an indication instrument means for transmitting power and data to said indicating instrument, means for making said indicating instrument visible to a user of said rear view mirror, means for attaching said indicating instrument to said rear view mirror including access means for accessing instrument controls and adjustments on the indicating instrument and removal means for removal of said indicating instrument, said means for trans-

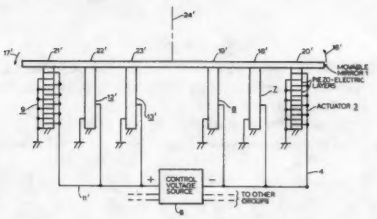
mitting power and data to said measuring instrument further comprising a ground connection to a car's electrical system by means of direct contact between a ground ring on said measuring instrument and said grounded reflective silvered surface on said mirror; at least one pressure clip which contacts electrically active regions on the indicating instrument in such a manner as to assure low resistance electrical contact and sufficient numbers of conductors to transmit said data and power; and a cable with a multiplicity of conductors which is connected on one end to said pressure clips and exits said rear view mirror.

4,588,268

TIP-TILT MIRROR ACTUATION SYSTEM HAVING SIMPLIFIED DRIVER CIRCUITRY

Ralph E. Aldrich, Acton, Mass., assignor to Itek Corporation, Lexington, Mass.

Filed Mar. 12, 1984, Ser. No. 588,589
Int. Cl.[4] G02F *1/29*; G02B *5/08*
U.S. Cl. 350—607 **27 Claims**



1. A position control system for selectively controlling the orientation of a controlled element having a given portion comprising:

N groups of electromechanical actuators, N being an integer of one or more, each group having more than one actuator with each actuator being fastened to said controlled element, each of said actuators in each group having a sensitivity which increases in relation to a said actuator's position further and further away from said given portion; and

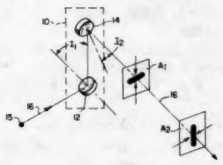
means for applying a set of N actuator control voltages to said actuators, each control voltage of said set being applied to all actuators within a corresponding group of actuators so that each actuator within a group has the same control voltage applied to it as is applied to all other actuators within said group.

4,588,269

APPARATUS WHICH SHAPES GAUSSIAN BEAMS BY SPHERICAL MIRRORS

David Kessler, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 5, 1984, Ser. No. 627,932
Int. Cl.[4] G02B *17/06, 5/10*
U.S. Cl. 350—619 **9 Claims**



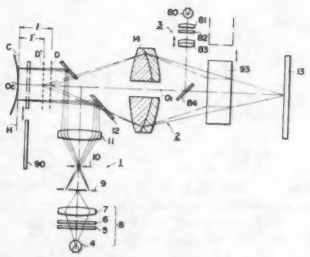
1. In apparatus having a laser which produces a gaussian beam of light, the improvement which comprises: optical means having at least four spherical mirrors arranged to eliminate coma which are located in spaced relation along the optical path of the beam and tilted relative to the laser beam so that the light beam is reflected from one mirror to the other and the beam is anamorphically shaped from (i) a circularly symmetrical input gaussian beam to an anamorphic gaussian beam or (ii) an anamorphic input gaussian beam to a circularly symmetrical gaussian beam.

4,588,270

CURVATURE MEASURING APPARATUS

Hiroshi Tamaki, Tokyo, Japan, assignor to Tokyo Kogaku Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 26, 1982, Ser. No. 436,853
Claims priority, application Japan, Oct. 28, 1981, 56-173529
Int. Cl.[4] A61B *3/10*
U.S. Cl. 351—212 **29 Claims**



1. A curvature measuring apparatus comprising:

an illuminating optical system for illuminating a surface to be measured, said illuminating optical system including light source means forming a pattern of radiating beams of at least two groups, each group being composed of at least two parallel straight lines in a virtual plane, the straight lines in one group being different in directions of arrangement from the straight lines in the other group, each group including at least one line whose characteristics are substantially different from the other lines in the group to serve as a reference line, and collimator lens means for orienting principal rays of illuminating beams of light emitted from said light source means through a pin hole aranged on an optical axis, to be parallel to said optical axis so as to illuminate said surface to be measured by said illuminating beams of light;

detecting means positioned in a virtual plane which is afocal with the plane containing said light source means for detecting said illuminating beams of light reflected from said surface; and

arithmetic means for calculating a radius of curvature of said surface from changes in inclination and pitch which are produced between a pattern of projected straight-lines and said pattern of radiating beams from said light source means.

4,588,271

OVERHEAD PROJECTOR

Bunsuke Emura, Musashino, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 31, 1984, Ser. No. 645,965
Claims priority, application Japan, Sep. 2, 1983, 58-136177[U]; Sep. 6, 1983, 58-138020[U]
Int. Cl.[4] G03B *21/06*
U.S. Cl. 353—66 **12 Claims**

1. An overhead projector wherein an object to be projected, which is disposed on a reflective Fresnel plate, is illuminated,

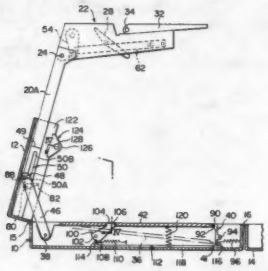
and the light reflected therefrom is projected onto a screen, comprising:

a base frame to which said reflective Fresnel plate is secured;

at least one support pivotally supported at its bottom end on said base frame, and foldable toward said base frame;

a projection unit pivotally supported at a top portion of said at least one support and including an illumination optical system and a projection optical system, said projection unit being movable to a folded position and an unfolded position;

a support lock releasing member provided on said projection unit;



a projection unit lock mechanism for locking said projection unit against said at least one support when said projection unit is in said folded position; and

a support lock mechanism, comprising a lock member provided on said at least one support and movable between a locked position, in which said at least one support is erect, and an unlocked position, said releasing member moving said lock member from said locked position to said unlocked position in response to movement of said projection unit to said folded position.

4,588,272

FILM CARTRIDGES, FILMS AND CAMERAS ADAPTED FOR USE THEREWITH

Takeo Hoda, Sakai; Nobuyuki Taniguchi, Tondabayashi, and Kiyoshi Seigenji, Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

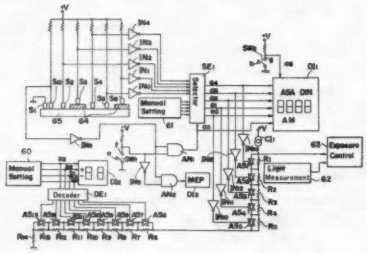
Continuation of Ser. No. 385,311, Jun. 4, 1982, Pat. No. 4,431,283. This application Oct. 28, 1983, Ser. No. 546,537

Claims priority, application Japan, Jun. 8, 1981, 56-88625

The portion of the term of this patent subsequent to Feb. 14, 2001, has been disclaimed.

Int. Cl.[4] G03B *7/24*

U.S. Cl. 354—21 **17 Claims**



1. Camera apparatus for use with a film cartridge formed with five first areas and a second area, said first area having weights of 4, 2, 1, $\frac{2}{3}$ and $\frac{1}{3}$, respectively, and being conductive and non-conductive with said second area in dependence upon the APEX value Sv of film speed of a film contained in said film cartridge, said camera apparatus comprising:

means for detecting said first areas which are conductive with said second area;

means for calculating the summation of the weights of the first areas detected by said detecting means and adding a predetermined constant value to the summation to generate a first signal directly indicative of the APEX value of the film speed represented by said first areas;

circuit means for receiving said first signal; and

means for generating a second signal indicative of a particular film speed;

means for determining whether none of, or at least one of, said first areas is conductive with said second area; and

a selector for feeding said first signal to said circuit means when it is determined by said determining means that at least one of said first areas is conductive with said second area and feeding said second signal to said circuit means when it is determined by said determining means that none of said first areas is conductive with said second area.

4,588,273

INFORMATION INPUT DEVICE FOR A CAMERA

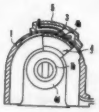
Toru Nagata, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

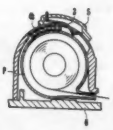
Filed Nov. 6, 1984, Ser. No. 668,743

Claims priority, application Japan, Nov. 11, 1983, 58-210958

Int. Cl.[4] G03B *7/24*

U.S. Cl. 354—21 **16 Claims**





1. An information input device for a camera, comprising:

(A) signal input means provided at a film cartridge chamber of the camera; and

(B) shielding means changeable between at least two states including a first state in which said shielding means shields said signal input means and a second state in which said shielding means exposes said signal input means.

4,588,274

DATA RECORDING CONTROL DEVICE

Jiro Kazumi, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 14, 1983, Ser. No. 561,549

Claims priority, application Japan, Dec. 21, 1982, 57-224383

Int. Cl.[4] G03B *17/24*

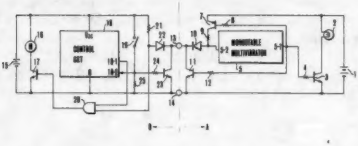
U.S. Cl. 354—105 **7 Claims**

1. A date recording control device for a camera system including a data recorder capable of recording data on a film surface and a camera, comprising:

(a) data recording initiation signal forming means for initiating an exposure of data;

(b) a single line connected between the camera and the data

recorder for transmission of a signal from said data recording initiation signal forming means; and



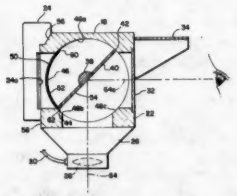
(c) data recording termination signal forming means for producing a data recording termination signal transmitted by said single line from said recorder to said camera.

4,588,275

PHOTOGRAPHIC APPARATUS

Jan van der Meer, Enschede, Netherlands, assignor to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 30, 1985, Ser. No. 728,928
Int. Cl.⁴ G03B *19/12*
U.S. Cl. 354—150 **9 Claims**



1. A camera comprising:

a frame assembly;

means connected to said frame assembly for mounting film at an exposure plane;

a viewing screen connected to said frame assembly;

an objective lens connected to said frame assembly;

a mirror pivotally mounted in said frame assembly for selective movement between a first position wherein image-forming light rays entering said camera through said objective lens are redirected by said mirror toward said screen and a second position wherein such light rays are redirected by said mirror toward said exposure plane; and

a dark slide mounted for movement timed to relate to the movement of the mirror between its first and second positions, and configured and arranged to provide a light seal between said exposure plane and the interior of said camera before said mirror is in its said second position and to permit such light rays to reach said exposure plane when said mirror is in its said second position.

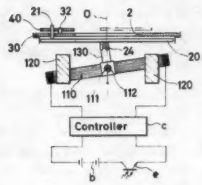
4,588,276

IRIS DIAPHRAGM DEVICE FOR A CAMERA

Hitoshi Kaise, Nirasaki, Japan, assignor to Nippon Seimitsu Kogyo Kabushiki Kaisha, Kofu, Japan

Filed May 29, 1985, Ser. No. 738,758
Int. Cl.⁴ G03B *9/06*
U.S. Cl. 354—271.1 **10 Claims**

1. A diaphragm device for a camera comprising a plurality of iris diaphragm leaves for forming an iris aperture having the center through which an optical axis passes, pivotally disposed at equal intervals around said iris aperture and each having a cam slot; a leaf operating disc provided with sliding pins slidably admitted into said cam slots bored in said iris diaphragm leaves and disposed concentrically rotatably relative to said iris aperture so as to permit opening or closing motion of said iris diaphragm leaves; a drive element comprising at least one stationary magnetic member and a movable magnetic ring formed in a noncircular shape having its center substantially in agreement with the optical axis and having remote segments opposite to said stationary magnetic member and near segments each having pivot pin extending outwardly in the direction perpendicular to the optical axis, said movable magnetic ring being swingingly rotated around said pivot pins by electromagnetic interaction between said stationary magnetic member and said movable magnetic ring; and a connecting lever for transmitting rotational motion of said movable magnetic ring to said leaf operating disc.

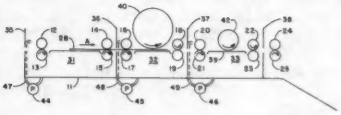


4,588,277

WATERLESS LITHOGRAPHIC PLATE PROCESSOR

Robert Buckler, P.O. Box 2127, Mansfield, Ohio 44905

Filed Jun. 22, 1984, Ser. No. 623,111
Int. Cl.⁴ G03D *5/00*
U.S. Cl. 354—317 **7 Claims**



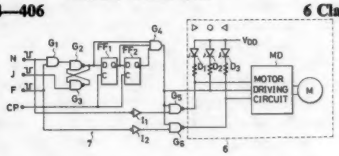
1. Apparatus for processing photolithographic plates for waterless printing comprising a frame, a first pair of drive rollers, a solution zone, a second pair of drive rollers, a third pair of drive rollers, a treating zone, a reciprocating brush, a fourth pair of drive rollers, a fifth pair of drive rollers, a dye zone, a rotating brush, a sixth pair of drive rollers, a pair of exit rollers, each pair of rollers mounted on said frame and serving both as a drive and a squeegee to minimize carryover of liquid from one tank to another and to prevent the exit of liquid on said plate after processing, pump means for circulating treating fluid to each tank, and motive means for driving said pump mans, rollers and brushes.

4,588,278

LENS DRIVING DEVICE OF AN AUTO-FOCUS SYSTEM

Hirofumi Horigome, Kawasaki, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Jan. 28, 1983, Ser. No. 462,041
Claims priority, application Japan, Jan. 30, 1982, 57-13713
Int. Cl.⁴ G03B *3/10*
U.S. Cl. 354—406 **6 Claims**



1. A device for driving to move a focusing lens of an auto-

focus system depending upon the current focus condition, said device comprising:

means for measuring a distance to an object of interest;

first processing means for processing the measured distance successively to determine the focus condition corresponding to the measured distance, said focus condition being either one of too close, in-focus and too far conditions;

storing means for storing a first predetermined number of the focus conditions successively determined by said first processing means;

second processing means for processing the thus stored first predetermined number of focus conditions to produce an in-focus indication signal only when said first predetermined number of focus conditions is found to include at least a second predetermined number of in-focus conditions; and

lens driving means connected to said first and second processing means for driving to move said lens depending upon the current focusing condition, said driving means stopping to move said lens in response to said in-focus indication signal supplied from said second processing means irrespective of the focus condition of the last one of said first predetermined number of focus conditions.

4,588,279

CLEANING ROLLER INTERMEDIATE TRANSFER MEMBER

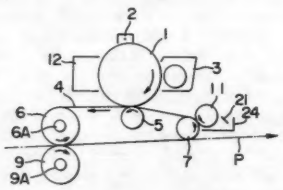
Masakazu Fukuchi, Hachioji; Kiyoshi Kimura, Iruma; Noriyoshi Tarumi, Hachioji; Tadashi Miwa, Kunitachi; Yukio Okamoto, Hachioji, and Kunio Ito, Tama, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Oct. 24, 1983, Ser. No. 544,965

Claims priority, application Japan, Oct. 27, 1982, 57-187504; Nov. 11, 1982, 57-196799; Nov. 12, 1982, 57-197636; Nov. 12, 1982, 57-197637

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—3 TR **4 Claims**



1. Reproducing apparatus comprising:

a toner image forming member;

transfer material;

a rotatable intermediate transfer member for transferring a toner image from said toner image forming member at a first transfer position to said transfer material at a second transfer position;

means for heating said intermediate transfer member;

and cleaning means for cleaning toner remaining on said intermediate transfer member after said second transfer position, said cleaning means comprising a cleaning roller for contacting and cleaning said residual toner from said intermediate transfer member and having an outer layer comprising an adiabatic porous substrate for retaining heat transferred to said outer layer from said intermediate transfer member and an outer surface layer on the outer surface of said adiabatic porous substrate, said outer surface layer comprising a thin metallic member comprising nickel.

4,588,280

IMAGE FORMING APPARATUS AND PROCESS UNIT DETACHABLY MOUNTABLE THERETO

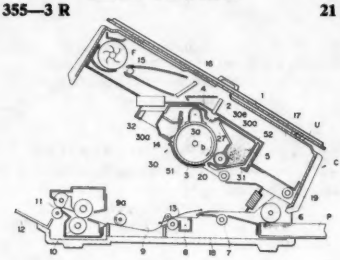
Hiroshi Ogawa; Mototada Toriumi, and Shigeyoshi Onoda, all of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 10, 1983, Ser. No. 521,835

Claims priority, application Japan, Aug. 17, 1982, 57-143105; Aug. 23, 1982, 57-145817

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—3 R **21 Claims**



1. A process unit detachably mountable to a predetermined portion of a main assembly of an image forming apparatus, comprising:

an image bearing member including a photosensitive member;

process means actable on said image bearing member;

a casing having an exposure opening for allowing light to reach said image bearing member from outside thereof, said exposure opening being formed in a recessed portion of said casing;

a protection cover for operably closing the exposure opening of said casing to protect said image bearing member; and

means for supporting said protection cover for movement between a closing position wherein it closes the exposure opening and a retracted position wherein it is retracted from the closing position, said protection cover being adapted to be moved, when said process unit is mounted to the predetermined portion of the main assembly, by a member of the main assembly disposed adjacent an optical system of the main assembly, and adapted to be aligned with the exposure opening of said casing when said process unit is mounted to the predetermined portion of the main assembly, from the closing portion to the retracted position, said cover being opened toward said image bearing member and being in the recess when it is in the retracted position.

4,588,281

FUSING APPARATUS

Michael R. Elter, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 4, 1984, Ser. No. 647,005

Int. Cl.[4] G03G *15/20*

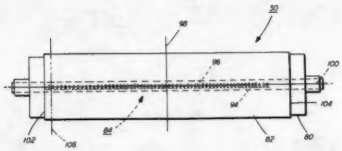
U.S. Cl. 355—3 FU **10 Claims**

3. An apparatus for fusing images onto a sheet of support material, including:

a fuser roll arranged to contact the sheet of support material having the image to be fused thereon; and

a heating element disposed internally of said fuser roll and extending substantially along the longitudinal axis thereof, said heating element being asymmetrical with respect to a reference axis extending through the center of said fuser roll and normal to the longitudinal axis thereof, said heating element extending from one end of said fuser roll substantially along the longitudinal axis of said fuser roll

to a preselected position intermediate the reference axis and other end of said fuser roll, said heating element including a heating lamp extending from at least said one end of said fuser roll to at least said other end thereof, and a heating filament disposed internally of said heating lamp



and extending from said one end of said fuser roll to said preselected position wherein one edge of the sheet of support material is aligned with a registration mark on said fuser roll with the registration mark being closely adjacent to said one end of said fuser roll.

4,588,282

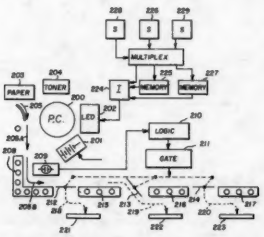
MULTIPLEXED PHOTOCOPIER SYSTEM WITH PORTABLE SCANNER

Alfred B. Levine, P.O. Box 9516, Washington, D.C. 20016

Continuation of Ser. No. 84,851, Dec. 4, 1979, abandoned, which is a division of Ser. No. 925,290, Jul. 17, 1978, Pat. No. 4,251,153, which is a continuation-in-part of Ser. No. 775,480, Mar. 8, 1977, abandoned, which is a continuation-in-part of Ser. No. 718,260, Aug. 27, 1976, Pat. No. 4,182,568. This application Jun. 4, 1984, Ser. No. 617,344

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—3 R **15 Claims**



1. In a two part photocopier system including as a first part a portable camera and associated camera memory adapted to be carried about by a user free of any mechanical or electrical connection with a developer and printer, and operating to read and nonvisably record optical images from an external medium that may include a document or other object, and with said nonvisably recorded images being transferable from the camera memory at the convenience of the user,

and said photocopier system including as a second part a developer and printer mechanism that is mechanically and electrically separated from the portable camera and camera memory, and operating to receive, develop, and print on copy paper said nonvisible images when they are transferred from the portable camera and camera memory,

said developer and printer mechanism having a buffer memory for receiving and retaining said nonvisible images, together with display means for selectively displaying said transferred nonvisible images, and additionally including printing means for selectively printing said transferred nonvisably recorded images on paper,

a plurality of said portable camera and associated memory units for reading and nonvisably recording images for later display and printing,

the memories of said camera units being selectively plugged into said developer and printer unit to mechanically and electrically make electrical connection thereto and to enable the transfer of nonvisably recorded images to said developer and printer unit when the users desire to later display visable images corresponding to any nonvisably recorded image, and when the users desire to later print paper copies of any of said earlier recorded images.

4,588,283

ELECTROPHOTOGRAPHIC COPYING APPARATUS WITH ORIGINAL LIGHT DETECTOR

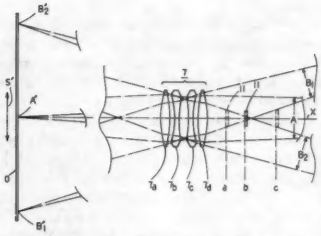
Mitsuhiro Tokuhara, Chigasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 507,582, Jun. 24, 1983, abandoned. This application Nov. 26, 1984, Ser. No. 674,718

Claims priority, application Japan, Jul. 5, 1982, 57-116449

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—14 E **24 Claims**



1. An electrophotographic copying machine comprising:

means for scanning an original to be copied;

an electrophotographic photosensitive member disposed to pass succeedingly by a charging station, an exposure station and a development station;

means for charging said photosensitive member at the charging station;

optical means for exposing said photosensitive member to a light image of the original at the exposure station, said optical means including means for illuminating the original and lens means for forming the light image of the original on said photosensitive member;

development means for applying a developer to said photosensitive member at the development station;

a single light receiving element for forming a signal corresponding to the amount of light which has been received by said light receiving element, said light receiving element being disposed at such a position as to receive the light from said lens along an optical path between said lens and said photosensitive member and also as to receive first, second and third light beams from the central, one end and the other end portions, respectively, of the original with respect to the direction perpendicular to the direction in which the original is scanned, wherein, at such position, the first light beam from the central portion and the second light beam from the one end portion cross each other and the first light beam and third light beam from the other end portion cross each other; and

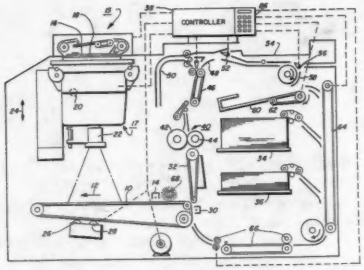
means for controlling the darkness on a copied image in accordance with the signal from said light receiving element.

4,588,284

CONTROL SYSTEM

Anthony M. Federico, Webster; Kenneth R. Kaisen, and Ernest L. Legg, both of Fairport, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 2, 1983, Ser. No. 528,768
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—14 R 7 Claims



1. A processing system for producing copies of an original, the system having a plurality of operating components, a movable photoreceptor belt and a first plurality of in process images including,

means for producing latent images on said belt, said latent images being one portion of said in process images,

development means for applying development material to each of the latent images to develop the latent images,

a transfer station adjacent the moving belt,

means for feeding seriatim sheets of copy material from a supply station to said transfer station to transfer developed images to said sheets, said developed images on said sheets being another portion of said in process images,

means for generating a first series of control pulses on equal cycles, said control pulses associated with each of the first plurality of in process images for controlling the operation of the operating components on the first plurality of in process images to produce said copies of an original,

means to alter the number of the first plurality of in process images to a second plurality of in process images, and

means to generate a second series of control pulses associated with the second plurality of in process images for controlling the operation of the operating components on the second plurality of in process images to produce said copies of an original.

4,588,285

RESIDUAL TONER COLLECTING DEVICE FOR ELECTROPHOTOGRAPHIC COPIER

Izumi Tagoku, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

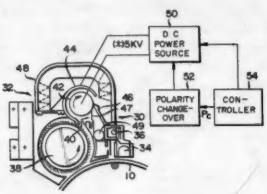
Filed Jun. 20, 1984, Ser. No. 622,489
Claims priority, application Japan, Jun. 20, 1983, 58-109346; Aug. 4, 1983, 58-141892
Int. Cl.[4] G03G *15/08*
U.S. Cl. 355—15 13 Claims

1. A device for collecting an untransferred dry process developer for use with a cleaning device which removes untransferred dry process developer particles having a charge of a first polarity remaining on an image bearing member of an image forming apparatus, said device comprising:

(a) a dc bias power source;

(b) a first electrode member connected to said dc bias power source and being thereby charged with a dc bias voltage opposited in polarity to said charge of said first polarity;

(c) a second electrode member connected to said dc bias power source and being thereby charged with a dc bias voltage of the same polarity as said charge of said first polarity; and



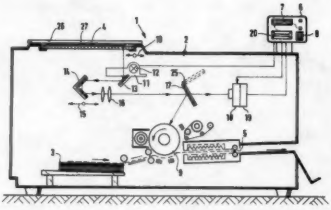
(d) bias voltage control means connected to said dc bias power source and said first and second electrode members for varying the magnitude of each of said dc bias voltages of said first and second electrode members.

4,588,286

COPYING APPARATUS WITH USE REGISTERING MEANS

Hermann Stockburger, Kirnachweg 7, D-7742 St. Georgen, and Hans-Georg Winderlich, Alban-Dold-Str. 1, D-7730 Villingen-Schwenningen, both of Fed. Rep. of Germany

Filed Mar. 15, 1985, Ser. No. 712,406
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1984, 3410774
Int. Cl.[4] G03B *27/52*
U.S. Cl. 355—40 3 Claims



1. Copying apparatus in which for registering the use thereof an original together with a user characterizing information is recorded in addition to the copy to be generated and prior to the generation thereof and this copy is stored, comprising a support for receiving an original to be copied, copying means, control means, a station for introducing user representative data and comparing means for comparing at least a portion of the original when recording or of the record thereof with the respective copy portion and for providing an output signal to the control means causing an interruption of the copying process in case of a lacking predetermined amount of coincidence between the respective portions.

4,588,287

FULL-FRAME ILLUMINATION AND IMAGING SYSTEM

Richard A. Spinelli, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 14, 1985, Ser. No. 733,819
Int. Cl.[4] G03B *27/44, 27/54*
U.S. Cl. 355—46 3 Claims

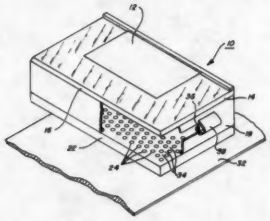
1. An illumination and imaging system for illuminating a document and for transmitting an image of said document onto a photosensitive surface, said illumination and imaging system comprising:

a generally transparent platen having diffusely reflective side surfaces for supporting the document to be reproduced,

a light housing connected to the bottom of said platen in a

light-tight manner, said housing having diffusely reflective interior side surfaces,

a two-dimensional, full frame lens array connected to the bottom of said light housing in a light-tight manner, said lens array comprising a plurality of individual lenslets separated by opaque insulating material, the top surface of said lens array partially covered by a reflective layer formed between the lenslet interstitial array, and



means for coupling illumination into the light housing, said illumination being diffusely reflected from said platen and light housing sides and from the interstitial lenslet area and document to provide a generally uniform level of illumination at the platen/document interface, a reflected image of the document being projected through the lens array onto the photosensitive surface.

4,588,288

STATIC PRESSURE BEARING AND TRANSPORT DEVICE UTILIZING THE SAME

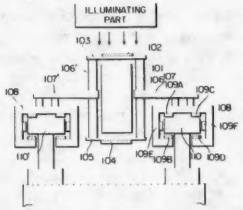
Mikio Nakasugi, Tokyo; Takao Yokomatsu, Yokohama, and Junji Isohata, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 22, 1984, Ser. No. 623,473

Claims priority, application Japan, Jul. 1, 1983, 58-119679; Jul. 1, 1983, 58-102261[U]

Int. Cl.⁴ G03B *27/42*; F16C *32/06*

U.S. Cl. 355—53 **7 Claims**



1. A static pressure bearing comprising:

a shaft member;

a bearing member supported in spaced relation on said shaft member;

plural fluid supply means for supplying pressurized fluid in a gap between said shaft member and said bearing member; and

means for controlling said plural fluid supply means to regulate the ratio of the change in dimension of said gap to the change in pressure of said supplied fluid.

4,588,289

DOCUMENT SIZE READING DEVICE FOR CONTINUOUSLY VARIABLE MAGNIFICATION TYPE COPYING MACHINE

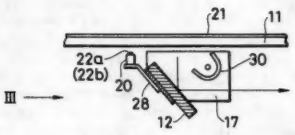
Manabu Imoto, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 27, 1984, Ser. No. 654,913

Claims priority, application Japan, Nov. 5, 1983, 58-207984

Int. Cl.⁴ G03B *27/34, 27/40, 27/70*

U.S. Cl. 355—57 **5 Claims**



1. In a continuously variable magnification type copying machine in which a first mirror for receiving a light beam reflected from an original on a stationary platen is provided below said stationary platen in such a manner that said first mirror is movable parallel to said platen, and wherein a light beam reflected from said first mirror is applied through a second mirror and a magnification varying optical system to a photosensitive element, the improvement comprising a size reading device comprising an edge detector for detecting the size of an original on said platen, at least a portion of said edge detector being movable with said first mirror, and means for detecting the amount of movement of said edge detector.

4,588,290

ORIGINAL HOLDING PLATE HINGING MECHANISM

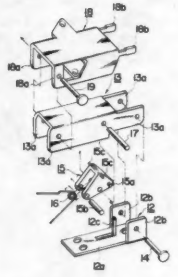
Yoshihiro Ohtsuka, 762-2, Aza-Asahidani, Niiharuchyou, Midori-ku, Yokohama-shi, Kanagawa-ken 227, Japan

Filed Mar. 18, 1985, Ser. No. 713,161

Claims priority, application Japan, Mar. 21, 1984, 59-53917; Nov. 15, 1984, 59-242082

Int. Cl.⁴ G03B *27/62, 27/64*

U.S. Cl. 355—76 **3 Claims**



1. A hinging mechanism for a holding plate of a copying machine which has an upper material support plate, comprising in combination:

(a) a bracket (12) having a rectangular base plate (12*a*) with one end portion and a central portion, also side plates (12*b*) extending upright on both sides of said base plate end portion plus a control piece (12*c*) extending upright from said central portion;

(b) a rectangular supporting member (13) sized to cooperate with the bracket (12), likewise with side plates (13*a*) having one end section, said one end section being hinged for rotation to the bracket side plates (12*b*) by a first pin (14),

also a cam-like stopping member (15) with a narrow end and a cam end interposed between the supporting member side plates (13*a*), rotatably hinged thereto by a second pin, said stopping member defining a predetermined angle, said stopping member (15) cooperating with the control piece (12*c*), a spring (16) urging the stopping member (15) towards the supporting member (13) and away from the upper original material support plate, stopping pins (15*a*) projecting from both sides of the cam end and a pressure receiving pin (15*b*) projecting from the narrow end, said stopping pin (15*a*) abutting the edges of the supporting member side plates (13*a*) to control the turning of the stopping member (15);

(c) a rectangular lifting member (18) with side walls (18*a*) sized to overlay the supporting member side plates, said side walls being hinged to said supporting member side plates at the end opposite said one end, stopping projections (18*b*) at the one end of said lifting member (18), a holding plate (H), with a fixed end and a free end, said holding plate being fixed to the lifting member (18) at the fixed end;

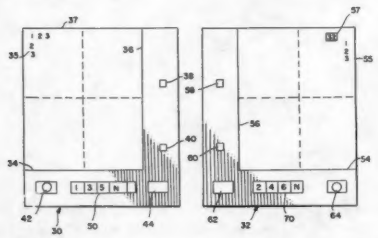
whereby, when the free end of the holding plate (H) is lifted up for copying operation, the holding plate turns together with the lifting member (18) and supporting member in a clockwise direction on the first hinge pin (14), after the holding plate (H) has been turned through the predetermined angle, the stopping member (15) is released from engagement of the control piece (12*c*) and allowed to be turned in a counterclockwise direction by the resilient force of the spring (16) so that although the stopping pins (15*a*) engage the stopping projections (18*b*), the stopping pins do not engage the stopping projections until the holding plate is turned through the predetermined angle; when a thick material is placed on the copying machine, the pressure receiving pin (15*b*) has been brought into contact with the control piece (12*c*) and turned in a clockwise direction against the force of the spring (16) and the stopping pines (15*a*) have already been disengaged from the stopping projections (18*b*) so that the holding plate turns in a counterclockwise direction and lies substantially horizontally on the material to be copied to cover it.

4,588,291

METHOD OF MANUFACTURE OF PRINTING PLATES FROM PREPARED COPY

Lawrence O. Lulay, Peoria, and Steven F. Nichols, Pekin, both of Ill., assignors to C & H Printing, Inc., Peoria, Ill.

Filed Nov. 13, 1984, Ser. No. 671,008
Int. Cl.[4] G03B *27/32*
U.S. Cl. 355—77 **5 Claims**



1. A method for preparing printing plates using photographic techniques, said plates of the type for manufacture of a multiple page, bound publication, said method comprising, in combination the steps of:

(a) preparing a serial set of page copy for a multiple page, bound publication;

(b) mounting each page of the set on a separate index control sheet, each one of said control sheets including a code designation associated with the page number of the set, each one of said control sheets also including index mounting means for positioning the sheet on a photographic platen; and each of said control sheets also including indicia for aligning the page copy on the control sheet, said mounting step performed to place the serial page of copy on the corresponding index control sheet in a proper indexed orientation;

(c) positioning a subset of index control sheets on a photographic platen by coordinating the code designations with a platen position and by placing the control sheet mounting means in cooperative relation with mounting means prepositioned on the platen;

(d) preparing a photographic negative by photographing the copy positioned on the platen; and

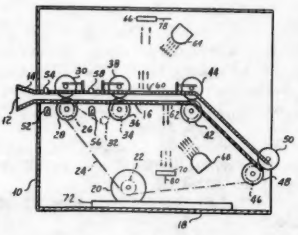
(e) preparing a printing plate directly from the photo negative using a photographic exposing apparatus.

4,588,292

UNIVERSAL DOCUMENT VALIDATOR

James D. Collins, Holland, Mich., assignor to Rowe International, Inc., Whippany, N.J.

Filed May 16, 1983, Ser. No. 494,857
Int. Cl.[4] G06K *9/74*; G01N *21/59, 21/86*
U.S. Cl. 356—71 **5 Claims**



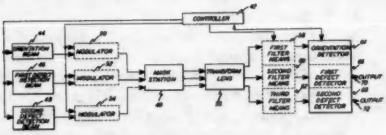
1. A device for validating domcuments including in combination means forming a document transport path having an entrance and an exit, a light detector positioned adjacent to said path, a source of light, means for directing light from said source toward a predetermined location along said path and from said predetermined location to said detector in the abasence of a document in said path to produce a first output therefrom, means corresponding to said first output representing a desired output of said detector with no document in the transport path and with light from said source directed toward said predetermined location, means for obtaining second values from second subsequent outputs of said detector in the absence of a document in said path, means for dividing said first value by said second values to produce a correction quotient, means for moving a document along said path in a direction from said entrance to said exit, means for directing light from said source over a predetermined region of said document positioned at said predetermined location along said path and from said region to said detector to produce a third output therefrom, and means responsive to said third output and said correction quotient for affording an indication of the validity of the document.

4,588,293

METHOD AND APPARATUS FOR INSPECTING PHOTOMASKS TO DETECT DEFECTS

Norman N. Axelrod, New York, N.Y., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Dec. 12, 1983, Ser. No. 560,679
Int. Cl.[4] G06K 9/08; G01N 21/16
U.S. Cl. 356—239 40 Claims



1. Apparatus for inspecting masks to detect defects comprising:

a mask station for mounting a mask having features to be inspected;

means for projecting radiation through said mask;

means for detecting the orientations of said features;

means for suppressing the optical signal from the features corresponding to the determined orientations of the mask features; and

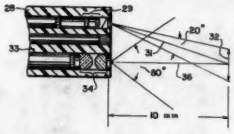
means for detecting defects in said mask and outputting indicia thereof.

4,588,294

SEARCHING AND MEASURING ENDOSCOPE

Walter P. Siegmund, Pomfret Center, Conn., assignor to Warner-Lambert Technologies, Inc., Morris Plains, N.J.

Filed Jun. 27, 1984, Ser. No. 625,149
Int. Cl.[4] G02B 23/26; A61B 5/00
U.S. Cl. 356—241 23 Claims



1. In a visual inspection unit of the type used to observe flaws, cracks, or other defects or imperfections of matter in industrial, medical or veterinary situations located remotely relative to an observer an assembly for searching and measuring comprising:

at least two image-transmitting systems each fitted with an objective lens at a distal end all enclosed in a common housing,

a first image-transmitting system being fitted with a wide angle, fixed focus objective lens with corresponding large depth of field for searching and locating a critical area; and

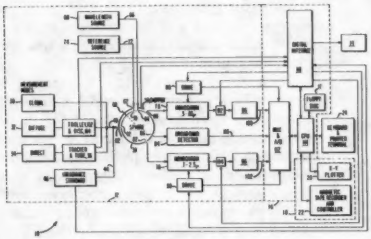
a second image-transmitting system being fitted with a narrow angle, fixed focus objective lens, said narrow angle lens having a relatively small depth of field and a relatively short, predetermined working distance and said second system having a predetermined magnification when in sharp focus while observing selected portions of said critical area.

4,588,295

RADIATION MEASURING SYSTEM

Herman G. Eldering, Chelmsford, and Arthur W. Kliman, Beverly, both of Mass., assignors to Baird Corporation, Bedford, Mass.

Division of Ser. No. 226,070, Jan. 19, 1981, Pat. No. 4,430,000.
This application Oct. 7, 1983, Ser. No. 540,040
Int. Cl.[4] G01J 3/00
U.S. Cl. 356—300 2 Claims



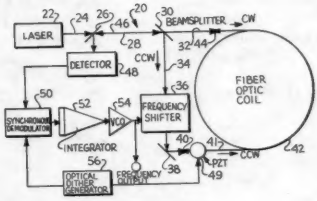
1. An instrument for measuring spectral data and including a diffuser for collecting radiation and means for measuring the radiation collected by said diffuser, said instrument being characterized by having a broad band detector for detecting temporal anomalies occurring during spectral measurements, said diffuser being an integrating sphere with a 180° field of view and a cosine response.

4,588,296

COMPACT OPTICAL GYRO

Richard F. Cahill, El Toro, and Eric Udd, Huntington Beach, both of Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Oct. 7, 1981, Ser. No. 309,254
Int. Cl.[4] G01B 9/02; G01C 19/64
U.S. Cl. 356—350 27 Claims



1. An optical device which uses counterpropagating beams of light capable of sensing at least one environmental effect including:

a source which produces a first beam of light;

means for splitting said first beam of light into at least second and third beams of light;

a light path, said light path being capable of having the environmental effect applied thereto;

means for directing said second and third beams of light in opposite directions along said light path to establish a counterpropagating light path for said second and third beams;

means capable of shifting the frequency between said second and third beams of light, said means being positioned in said second and third beams of light so that one of the beams is frequency shifted prior to passing through said counterpropagating light path and the other is frequency

shifted after passing through said counterpropagating light path;

means capable of varying nonreciprocal phase shift between said second and third beams of light positioned in said second and third beams of light so that one of the beams is varied prior to passing through said counterpropagating light path and the other is varied after passing through said counterpropagating light path;

means for recombining said second and third beams of light into a fourth beam of light after said second and third beams of light have been directed along said counterpropagating light path;

means for detecting said fourth beam of light and producing therefrom an output indicative of phase shift induced by the environmental effect;

means connected to said means of detecting and said means capable of varying nonreciprocal phase shift between said second and third beams of light for compensating said output of said means for detecting to restore said output of said means for detecting to the phase relationship without the environmental effect by producing an output indicative of the degree of phase compensation and applying said output indicative of the degree of phase compensation to said means capable of shifting the frequency between said second and third beams of light, said output indicative of the degree of phase compensation also indicating the amount of environmental effect; and

means to control the frequency output of said light source by varying the voltage applied thereto, which control means include:

an acousto-optic modulator switch positioned in said first beam of light capable of switching the frequency thereof; and

means associated with said detector means to compare the fringes on said detector as said frequency of the light source output is switched to determine which fringes bound the zeroth order peak.

4,588,297

OPTICAL PROFILE MEASURING METHOD

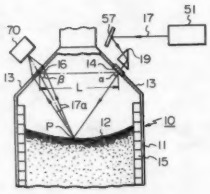
Koji Inazaki; Takashi Nangai, both of Muroran; Yasutomo Fujimori, and Hiroichi Kimura, both of Yokohama, all of Japan, assignors to Nippon Steel Corporation and Tokyo Shibaura Denki Kabushiki Kaisha, both of Kawasaki, Japan

Filed Jun. 8, 1983, Ser. No. 502,112

Claims priority, application Japan, Jun. 14, 1982, 57-101648; Mar. 23, 1983, 58-47251

Int. Cl.[4] G01B *11/24, 11/14*

U.S. Cl. 356—376 **7 Claims**



1. A method for measuring a profile of a surface of a material contained in a container by use of an optical detector capable of angular tracking and having a light receiver of a small field of view relative to the area of said surface, comprising:

a first set of steps for determining the location of a first point on said surface of the material, comprising:

emitting a laser beam pulse from a pulsing laser onto a first point P_1 on said surface of the material from a predetermined light-emitting position at a light-emitting angle α_1,

detecting the light-receiving angle β_1 of said laser beam pulse as reflected from said point at a predetermined light-receiving position which is spaced at a distance L from said light-emitting position, by causing angular movement of an optical detector which has a small field of view relative to the area of said surface, until that optical detector catches, centrally of said small field of view thereof, a beam spot of the light reflected from said first point, and

calculating the location of said point as a known first point from the two angles α_1 and β_1 and the distance L;

a second set of steps for determining the location of a second point on said surface of the material adjacent to said first point, comprising:

changing the light-emitting angle of emission of said laser beam through a small angle $\Delta\alpha$, to α_2, so that a succeeding pulse of said laser beam is incident upon a second point P_2 on the surface of the material which point is adjacent to said first point P_1 along a predetermined path,

detecting the light-receiving angle β_2 of said laser beam pulse as reflected from said second point so as to form a beam spot on said optical detector at a point that is deviated from the center of said small field of view of said optical detector, at the predetermined light receiving position, and

calculating the location of said second point as a known second point from the two angles α_2 and β_2 and the distance L; and

a set of succeeding steps for successively detecting succeeding points along said path on the surface of said material by repeating said second set of steps at least once, each time in relation to a respective previously-conducted said set of succeeding steps.

4,588,298

STEP TABLET

Masao Nakamura, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 1, 1983, Ser. No. 556,824

Claims priority, application Japan, Dec. 1, 1982, 57-182349[U]

Int. Cl.[4] G01N *21/00*

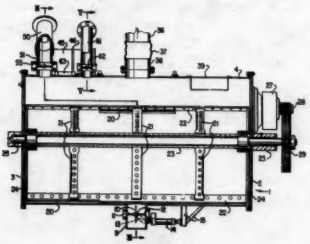
U.S. Cl. 356—443 **5 Claims**

1. A step tablet comprising: a plurality of step areas, each of said step areas having a different optical density, and said step areas being arranged in an order of optical density; and first and second sets of marking indicia, one indicium from said first set of marking indicia and one indicium from said second set of marking indicia located within each of said step areas, said first and second sets of marking indicia having different optical densities wherein indicia of said first set of marking indicia have an optical density at the maximum corresponding to a step area of said step tablet of minimum optical density, and indicia of said second set of marking indicia have an optical density at the minimum corresponding to a step area of said step tablet having a maximum optical density, each of said first and second sets of marking indicia comprising indicia of the same type within each set.

4,588,299
CEMENT MIXING PROCESS AND APPARATUS

Ronald O. Brown, Gloucester, and Ernest J. Delorme, London, both of Canada, assignors to Alslur Enterprises Limited, Gloucester and Contran Manufacturing (1982) Limited, London, both of, Canada

Filed Sep. 28, 1984, Ser. No. 655,935
Claims priority, application Canada, Oct. 18, 1983, 439241
Int. Cl.⁴ B28C 7/04
U.S. Cl. 366—8 **8 Claims**



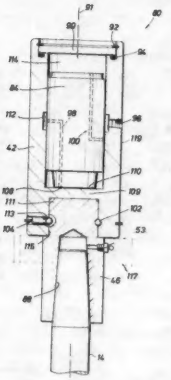
1. A cement slurry batcher for mixing on a batch basis, a predetermined amount of cement with a predetermined amount of water, said batcher comprising:
   (a) a substantially closed batching vessel for receiving said water and said cement,
   (b) cement inlet means,
   (c) water inlet means,
   (d) mixing means for mixing said water and said cement into a slurry,
   (e) slurry discharge means,
   (f) control means for regulating the predetermined amount of water and the predetermined amount of cement introduced into the vessel during each batch, and
   (g) air vent and cement dust collection means for venting entrapped air within said vessel exteriorly thereof and for collecting cement dust carried thereby during at least the introduction of said cement into said vessel, and which includes a water reservoir and conduit means for passing said entrapped air and cement dust carried thereby through water contained in said reservoir, said water reservoir further including water discharge means for discharging the water and collected cement dust from said reservoir to said vessel and wherein the water in the reservoir is included in said predetermined amount of water.

4,588,300
VIBRATOR ASSEMBLY

Jimmy R. Guy, Houston, Tex., assignor to American Precision Vibrator Co., Houston, Tex.

Filed May 29, 1984, Ser. No. 614,994
Int. Cl.⁴ B01F 11/00
U.S. Cl. 366—114 **17 Claims**

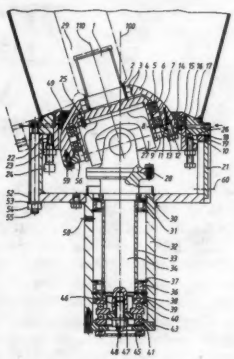
1. A vibrator assembly for imparting a periodic impacting force to an article to be vibrated, comprising:
   vibrator means defining an annulus therein for generating said force along the longitudinal axis of said vibrator means in response to pressurized fluid introduced into said vibrator means;
   mounting means interconnected between said vibrator means and said article and including an end portion extending into said annulus for transmitting said force from said vibrator means to said article said mounting means defining a circular area transverse to and including said longitudinal axis through which said force is transmitted; and
   retainer means interconnecting said vibrator means and said mounting means for permitting rotational motion of said vibrator means relative to said mounting means about said axis while restricting relative motion between said mounting means and said vibrator means in the direction of said axis.



4,588,301
CONICAL SCREW MIXER

Alfred Bolz, Isnyer Strasse 76, D-7988 Wangen/Allg., Fed. Rep. of Germany

Filed Sep. 30, 1983, Ser. No. 537,866
Claims priority, application Fed. Rep. of Germany, Dec. 11, 1982, 32245935
Int. Cl.⁴ B01F 7/14, 7/08
U.S. Cl. 366—287 **12 Claims**



1. A conical screw mixer, comprising:
   a conical mixing vessel which has a vertical axis and tapers inwardly toward the direction of a bottom region, said mixing vessel defining a product chamber and having a cover portion at the upper end thereof;
   a rotationally driven mixing screw which runs generally parallel to and along an inner wall of the mixing vessel and has a lower end which is pivotably and rotatably mounted outside of said product chamber and below said bottom region of the mixing vessel;
   a first drive secured on said cover portion and coupled to an upper end of said mixing screw for pivoting said mixing screw about the axis of said mixing vessel;
   a pivotably mounted sealing bell with a central opening which spans said lower end of said screw mixer and de-

fines an open space with said bottom region of said mixing vessel;

an angularly movable coupling housed within said pivotably mounted sealing bell;

a screw-in-bolt having an upper end inserted through said central opening of the sealing bell into said product chamber and attached to the lower end of the mixing screw, and a lower end attached to said angularly movable coupling by means of a screwable internal thread;

a second drive disposed below said mixing vessel and coupled and rotationally driving said screw-in-bolt for rotation of said mixing screw about its own axis;

an automatic readjustment sealing means adjacent to an outer surface of said sealing bell and separating the contents of said product chamber from said bottom region of said mixing vessel; and

shim ring means axially and radially securing said screw-in-bolt and said screw-in-bolt being rotatably supported relative to said sealing bell, whereby said sealing bell follows the motion of said mixing screw as it pivots about the axis of said mixing bell, and said sealing bell does not follow the motion of said mixing screw as said mixing screw rotates about its own axis.

4,588,302

DEVICE FOR QUICKLY LOCKING THE PAINT CONTAINING VESSELS IN APPARATUS FOR MIXING PAINTS AND THE LIKE

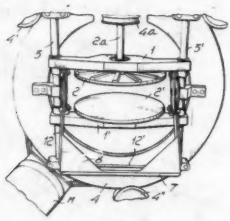
Giordano Pizzi, and Domenico Gargioni, both of Via Meucci, 28, 20083 Gaggiano (MI), Italy

Filed Dec. 27, 1984, Ser. No. 686,823

Claims priority, application Italy, Jan. 4, 1984, 20420/84[U]

Int. Cl.[4] B01F *15/00*

U.S. Cl. 366—349 **1 Claim**



1. A device for locking the paint containing vessels in apparatus for mixing or blending paints, comprising a substantially rigid metal frame including two parallelt extending vertical small columns slidingly supporting two upper and lower cross plates, said plates rotatably supporting thereon respective upper and lower disk members effective to be moved towards one another for clamping a said paint vessel therebetween, the upper disk member being rotatively driven through a pulley-belt drive and the lower disk member being substantially rotatably idly supported on said lower plate, a ring member being provided, essentially rigid with said frame and engaging, at the periphery thereof, with a plurality of pulleys, at least one whereof is a driving pulley operated by an electric motor effective to impart to said ring member and frame a swinging rotatable movement in the two directions, each said column further supporting, at an intermediate position thereof, a fixed saw tooth gear wheel at the central portion of which there is pivoted a respective lever forming one of the two ends of a structure like an open frame, said levers being coupled by a cross member encompassed by a box-like body effective to provide a grip portion, on each said lever there being pivoted, at two opposite and equispaced points of its pivot, two like length arms, in turn pivoted to said plates, a respective hook member being provided, each pivoted to a said respective lever for engaging with the teeth of a respective said saw tooth gear wheel for locking said plates at a desired position, the two hook members being coupled by a cross member biased by at least a hook disengaging spring member.

4,588,303

MEDICAL TIMER APPARATUS

Jonathan D. Wirtschafter, Minneapolis, Minn., and Richard S. Walton, Tempe, Ariz., assignors to Mediminder Development Limited Partnership, Minneapolis, Minn.

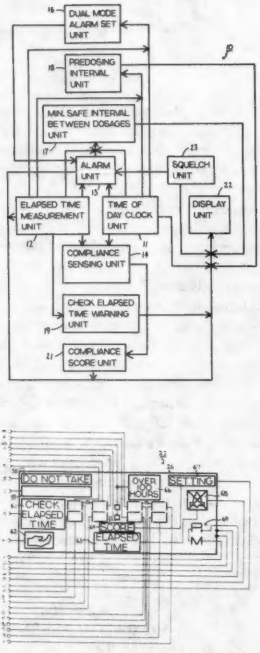
Filed Jun. 25, 1984, Ser. No. 624,931

Int. Cl.[4] G04B *47/00*

U.S. Cl. 368—10 **16 Claims**

MICROFICHE APPENDIX INCLUDED

(17 Microfiche, 1 Pages)



1. A medical timer device for use in protecting against inadvertent overdosage of at least one preselected medication, the device comprising:

(a) sensing means for sensing a preselected monitored parameter that evidences dispensation of such medication;

(b) input means for inputting a minimum safe interval between dosages;

(c) time measurement means operably connected to said sensing means for measuring the passage of time following a sensing of said preselected monitored parameter;

(d) comparison means for comparing said minimum safe interval between dosages with time as measured by said time measurement means; and

(e) first display means operably connected to said comparison means for signalling when time as measured by said time measurement means does not exceed said minimum safe interval between dosages.

4,588,304
PROGRAM CARRIER FOR SWITCHING CHRONOMETER SYSTEMS

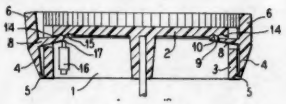
Friedrich X. Thoma, Haslach, Fed. Rep. of Germany, assignor to Dieter Graesslin Feinwerktechnik, Fed. Rep. of Germany

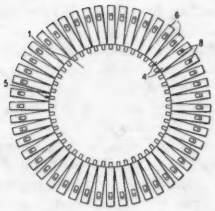
Filed Mar. 22, 1984, Ser. No. 592,298

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1983, 3310934

Int. Cl.⁴ G04F *8/00*

U.S. Cl. 368—107 **15 Claims**





1. In a program carrier for use in a switching chronometer system and wherein the program carrier comprises a motor-driven drum which has a plurality of switch elements at its circumference which can be displaced between an active and an inactive position and which interact with a sampler in their active position for the control of a switch, wherein the improvement comprises: said switch elements being integrally connected to said drum so as to form a single part and comprising radially outwardly extending arms connected to a periphery of the drum at a flexible integral joint; and first engagement means at a radially outer free end of each arm for engagement with second engagement means on the drum such that each arm may be variably positioned along a radial line from the center of the drum to the outer end of each corresponding arm.

4,588,305
ELECTRONIC CHRONOGRAPH WATCH HAVING ANALOG AND DIGITAL DISPLAY OF MEASURED TIME PERIODS

Albert Piguet, Le Solliat, and Jean-Daniel Dubois, L'Orient, both of Switzerland, assignors to Nouvelle Lemania S.A., L'Orient, Switzerland

Continuation of Ser. No. 449,227, Dec. 13, 1982, abandoned. This application Jan. 2, 1985, Ser. No. 688,275

Claims priority, application Switzerland, Dec. 28, 1981, 8313/81

Int. Cl.⁴ G04B *17/12*

U.S. Cl. 368—185 **10 Claims**

1. A chronograph-watch comprising:

a gear train formed of a plurality of rotating members in meshing engagement;

a set of rotating displaying parts attached to said plurality of rotating members of said gear train;

friction couplings between each one of said displaying parts and a corresponding one of said rotating members;

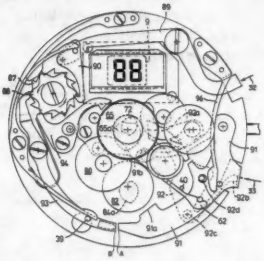
a step motor driving said gear train;

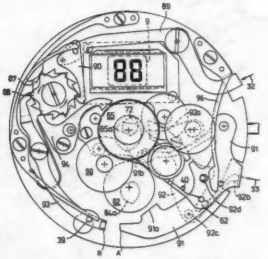
a time counting electronic circuit having an output connected to said motor;

a first switch connected to a first input of said counting circuit for starting and stopping said counting;

a second switch connected to a second input of said counting circuit for resetting said counting;

a start-and-stop mechanism provided with a first control pusher and a brake member, said brake member acting on said gear train for holding said gear train at rest, and said





brake member and said first switch being controlled by said first pusher; and

a return mechanism provided with a second control pusher and a set of hammer means for acting on said displaying parts, said hammer means and said second switch being controlled by said second pusher.

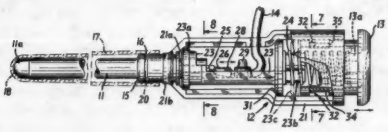
4,588,306
ELECTRONIC THERMOMETER PROBE ASSEMBLY

Laurie J. Burger, Attleboro Falls, Mass.; Donald E. Protzmann, Litchfield, and Robert F. Uhl, Cheshire, both of Conn., assignors to Chesebrough-Pond's Inc., Greenwich, Conn.

Filed Mar. 22, 1985, Ser. No. 715,019

Int. Cl.⁴ G01K *1/08*

U.S. Cl. 374—158 **2 Claims**



1. A probe assembly for an electronic thermometer comprising a handle, a probe extending from the handle, means for providing limited axial movement of the probe within the handle, resilient means providing a force urging the probe axially out of the handle, an elongated cylindrical cover having open and closed ends adapted to cover the probe, a plurality of protuberances spaced circumferentially around the interior of the cover adjacent to its open end, a circumferential receiving means on the handle located on the same axis as the probe, the protuberances on the cover adapted to snap with the receiving

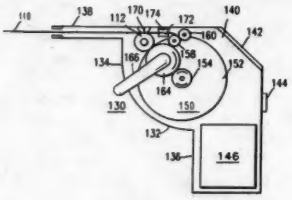
means on the handle, the closed end of the cover axially moving the probe when the cover is placed thereover and urged toward the handle to compress the resilient means and snap the protuberances with the receiving means, thereby causing the probe end to remain in intimate contact with the closed end of the cover, and a thumb button in the handle movable axially toward and into engagement with the probe, the resilient means coupled to the probe and the thumb button, and extending therebetween so that depression of the thumb button increases the force urging the probe out of the handle until the protuberances are unsnapped from the receiving means, the resilient means thereupon expanding to move the probe forwardly and eject the cover from the probe.

4,588,307

MEDICAL THERMOMETER WITH DISPOSABLE THERMOCOUPLE STRIP

Yoram Palti, Haifa, Israel, assignor to Fidelity Medical, Inc., Millburn, N.J.

Filed Mar. 23, 1984, Ser. No. 592,555
Int. Cl.⁴ G01K *1/14, 13/00*
U.S. Cl. 374—170 **8 Claims**



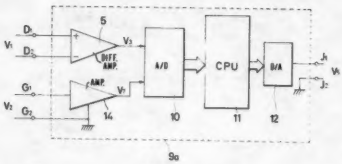
1. Medical thermometer device comprising in combination a housing; magazine means within said housing containing a plurality of thermometer strips, each of said thermometer strips including an elongated substrate, an elongated cover layer, a first conductor made from a first material, and a second conductor made from a second material, the first material and the second material being different, said first and second conductors being located between said substrate and said cover layer and extending longitudinally therebetween, said first and second conductors at a preselected location along said thermometer strips being joined near a distal end of said strip to form a thermocouple junction, said junction being exposed; means for selectively extending successive ones of said strips from said housing for insertion in a patient, and separating each of said strips from the next successive strip in said magazine means; contact means in said housing for selectively electrically contacting said first and second conductors, said contact means including a first contact made from the first material and a second contact made from the second material, said first contact selectively contacting said first conductor, said second contact selectively contacting said second conductor; temperature determining circuit means having an input coupled to said contact means and an output providing a temperature signal, said temperature determining circuit means being connected to said contact means by a first lead and a second lead, the first lead being made from the first material, the second lead being made from the second material, the first lead being connected to said first contact, the second lead being connected to said second contact; and display means on said housing coupled to said output for providing a visual representation of said temperature signal.

4,588,308

TEMPERATURE MEASURING DEVICE WITH THERMOCOUPLE

Hideyuki Saito, Tokyo, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Aug. 30, 1984, Ser. No. 645,626
Claims priority, application Japan, Sep. 2, 1983, 58-161600
Int. Cl.⁴ G01K *7/02, 7/12*
U.S. Cl. 374—181 **6 Claims**



1. A temperature measuring device comprising:

a thermocouple (M_1, M_2) having a first output signal (V_1) and a measuring point (A);

reference contacts (C_1, C_2) connected to said thermocouple;

a temperature detecting means (3), having a second output signal (V_2), arranged in the vicinity of said reference contacts (C_1, C_2), for detecting the temperature variation of said reference contacts (C_1, C_2);

a processing means for calculating the temperature at said measuring point (A), said processing means comprising:

(i) a differential amplifier circuit (5), having a third output signal (V_3), for amplifying said thermocouple output signal (V_1);

(ii) a linearization circuit, having a fourth output signal (V_4), (6) for linearlizing said temperature detecting means output signal (V_2);

(iii) an amplifier circuit (7), having a fifth output signal (V_5), for amplifying said linearized temperature detecting means fourth output signal (V_4); and

(iv) a buffer amplifier circuit (8) for amplifying a resultant voltage signal (V_3+V_5) obtained by combining said differential amplifier third output signal (V_3) and said amplifier circuit fifth output signal (V_5) and outputting a sixth output signal (V_6) which corresponds to the temperature at said measuring point (A); and

transmission lead wires (M_3, M'_3) for connecting said reference contacts (C_1, C_2) with said processing means to transmit said thermocouple output signal (V_1), and transmission lead wires (M_6, M'_6) for connecting said temperature detecting means (3) with said processing means to transmit said temperature detecting means output signal (V_2).

4,588,309

RESILIENT BEARING SEAL WITH ABILITY TO COMPENSATE FOR WEAR AND COMPRESSION SET

Hajime Uyehara, Westminister, and Rao R. Nimmagadda, Fountain Valley, both of Calif., assignors to Smith International, Inc., Newport Beach, Calif.

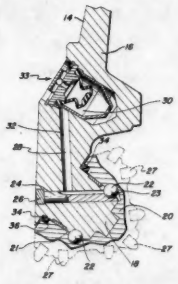
Filed Jun. 20, 1983, Ser. No. 505,578
Int. Cl.⁴ E21B *10/08*
U.S. Cl. 384—94 **6 Claims**

1. A rock bit having at least one bearing journal and a cutter rotatably mounted on the bearing journal, bearing surfaces between the journal and the cutter being substantially continuously lubricated by an internal supply of a hydrocarbon containing lubricant during operation of the rock bit, the rock bit further comprising:

a resilient O-ring seal disposed within an annular chamber formed between the journal and the cutter, the O-ring comprising a material which swells substantially when effectively exposed to the lubricant, said O-ring together with the lubricant comprising means for increasing the

volume of the O-ring relative to the state when the O-ring is initially mounted into the rock bit, whereby at least in its swollen state the O-ring is substantially compressed between the journal and the cutter, and

means in operative association with the O-ring for preventing effective exposure of the O-ring to the hydrocarbon containing lubricant until the cutter is repeatedly rotated



on the journal, the means comprising a coating on the O-ring of a material that substantially prevents penetration of the hydrocarbon based lubricant into the O-ring, and adapted to be substantially worn away from the O-ring during ordinary use of the O-ring in the rock bit, thereby permitting effective exposure of the O-ring to the hydrocarbon based lubricant during such ordinary use.

4,588,310

BEARING ARRANGEMENT TO BE SUBMERGED IN WATER OR A SLURRY

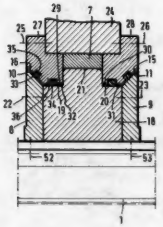
Günter Kupczik, Wittenbergener Weg 18, 2000 Hamburg 56, Fed. Rep. of Germany

Filed Jun. 13, 1984, Ser. No. 620,104

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1983, 3321593

Int. Cl.⁴ F16C *33/74;* E03F *9/00*

U.S. Cl. 384—152 **17 Claims**



1. In a bearing assembly for mounting a component, comprising

at least one inner axially extending bearing element centered around a predetermined axis and adapted to mount said component,

a bearing housing surrounding said inner bearing element,

said inner bearing element and bearing housing are mounted for relative rotation mutually,

gap-defining means including inclined gap portions disposed between said inner bearing element and said outer bearing housing and inclined relative to said predetermined axis, each said inclined gap portion, extends axially and radially outwardly of said bearing element and has a radially outer end open to the outside of said bearing assembly,

the improvement residing in that

said gap-defining means comprise a pair of confronting surface portions which define therebetween one of said inclined gap portions, one of the surface portions of said pair being non-rotatable with regard to said bearing housing, the other surface portion of said pair being adapted to be non-rotatable with regard to said component,

sealing ring means located in said gap-defining means and disposed in each said inclined gap portions and spaced from the radially outer end thereof, said sealing ring means affording a flow block across said inclined gap portions,

said sealing ring means comprise two sealing rings spaced apart with one sealing ring located in said inclined gap portion, and

an accumulation of lubricant for lubricating each said gap defining means between said two sealing rings.

4,588,311

BEARING ASSEMBLY FOR OSCILLATING ANGULAR MOVEMENT

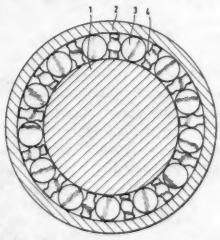
Dieter Heier, Gelsenkirchen, and Wilfried Gille, Dorsten, both of Fed. Rep. of Germany, assignors to Gelenkwellenbau GmbH, Essen, Fed. Rep. of Germany

Filed Oct. 4, 1985, Ser. No. 784,840

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1984, 3439385

Int. Cl.⁴ F16C *19/00*

U.S. Cl. 384—456 **2 Claims**



1. A bearing assembly for oscillating angular movement comprising:

an inner and an outer annular bearing part;

a plurality of roller members disposed between said inner and outer bearing parts; and

a plurality of swivel members interposed between at least some of adjacent ones of said roller members, said swivel members each occupying a smaller space circumferentially of the bearing than said individual roller members;

each of said swivel members comprising

a substantially cylindrical central part of smaller diameter than a roller member,

radially inwardly and outwardly extending portions having supporting faces engaging said inner and outer bearing parts, said supporting faces having a curvature which corresponds to that of said roller members, and

side faces formed at least on said radially inwardly extending portions of said swivel members, said side faces being shaped to interfit with said roller members.

4,588,312

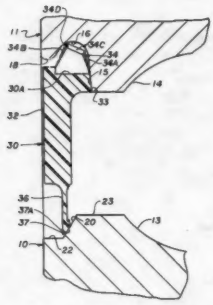
ANTIFRICTION BEARING WITH REMOVABLE THERMALLY EXPANDABLE AND CONTRACTABLE SEAL MEANS

Thorn W. Dickinson, Berlin, Conn., and Gilbert W. Geiger, deceased, late of Southington, Conn. (by Dolores A. Geiger, executrix), assignors to Fafnir Bearing - Division of The Torrington Company, New Britain, Conn.

Filed Apr. 18, 1985, Ser. No. 724,626

Int. Cl.[4] F16C *33/76, 19/52*

U.S. Cl. 384—482 **12 Claims**



1. A sealed antifriction bearing comprising inner and outer race rings with interposed antifriction elements riding the races of the rings, the outer ring having a circumferentially continuous groove, the inner ring having a seal surface in substantially axial registry with the outer ring groove, and a one-piece seal ring having an inner sealing face in positive wiping contact with the inner ring seal surface, the one-piece seal ring having a multiplicity of outwardly protruding resilient projections each terminating in a free end, the free ends of the projections in an unstressed condition, collectively defining an outside seal ring diameter greater than the maximum diameter of the outer ring groove, the seal ring projections being deflectable substantially in the plane of the seal ring with the free ends of the projections being continuously retained in compressively wedged engagement within the outer ring groove, whereby the outer ring circumferentially compresses the seal ring such that its inner sealing face continuously applies an axially inwardly directed thrust upon the seal surface of the inner ring and the assembly provides for seal ring expansion and contraction while maintaining a sealed bearing of high integrity.

4,588,313

FOUR-POINT CONTACT BEARING

Bernhard Knappe, Obereurheim, and Erwin Gerber, Untereuerheim, both of Fed. Rep. of Germany, assignors to FAG Kugelfischer Georg Schafer KGaA, Fed. Rep. of Germany

Filed Jan. 17, 1984, Ser. No. 571,560

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1982, 3305768

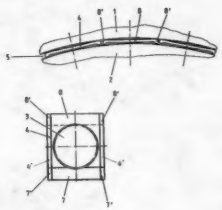
Int. Cl.[4] F16C *33/51*

U.S. Cl. 384—604 **10 Claims**

1. A four-point contact bearing comprising:

an outer race ring with an inner surface and an inner race ring inside the outer ring and having an outer surface, the inner and outer surfaces facing each other and each defining a respective inner and outer ball raceway, a first annular rim gap defined by and between the inner and the outer surfaces of the inner and the outer rings and adjoining a first axial side of the ball raceways and a second annular rim gap defined by and between the inner and the outer surfaces of the inner and the outer rings and adjoining a second axial side of the ball raceways opposite the first side; the ball raceways and the first and second annular rim gaps all having centers lying on the axis of the bearing; at the first annular rim gap the inner and the outer surfaces of the inner and the outer rings having respective radii measured from the bearing axis that are greater than the respective radii of the inner and outer rings at the second annular rim gap measured from the bearing axis;

a plurality of bearings rollably mounted in the ball raceways; and



a cage for the balls comprising a plurality of cage segments for holding the balls apart, each cage segment comprising first and second guide elements extending into the first and second rim gaps, respectively; the first guide element thereby being positioned at a greater radius measured from the bearing axis than the radius at which the second guide strap is positioned.

4,588,314

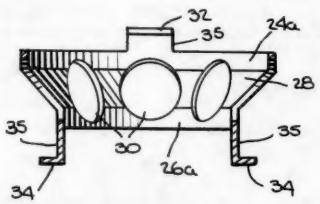
BEARING CAGE

Joseph Anscher, 1 Bayview La., Huntington, N.Y. 11743

Filed Aug. 15, 1984, Ser. No. 640,860

Int. Cl.[4] F16C *19/20, 33/00*

U.S. Cl. 384—614 **26 Claims**



5. An improved bearing cage for use in a unitized contact thrust bearing assembly of the type having

an outer bearing race having on its radially inward surface a curvilinear raceway,

an inner race coaxial with the first race having on its radially outward surface a curvilinear raceway in confronting relation to the curvilinear raceway of the outer race,

a complement of bearing balls between the inner and outer curvilinear raceways, and

a bearing cage, having upper and lower coaxial cylindrical shoulders, the diameter of the radially inner surface of the upper cylindrical shoulder being greater than the diameter of the radially outer surface of the lower cylindrical shoulder, said bearing cage having a connecting shoulder integral with the upper and lower cylindrical shoulders and having circumferentially disposed in said connecting shoulder and extending axially into said upper and lower cylindrical shoulders a plurality of ball bearing retaining cavities, wherein the improvement comprises:

a bearing cage having at least two upper restraining tabs, each disposed on a separate connecting means which extends axially upwards from the upper cylindrical shoulder and is integral with the upper cylindrical shoulder, each upper restraining tab being radially in-

wardly directed and positioned axially directly above one of the bearing retaining cavities and each upper restraining tab having a circumferential dimension less than or equal to the circumferential dimension of the bearing retaining cavity above which it is positioned,

said bearing cage having at least two lower restraining tabs, each disposed on a separate connecting means which extends axially downward from the lower cylindrical shoulder and is integral with the lower cylindrical shoulder and the lower restraining tab, each lower restraining tab being radially outwardly directed and positioned axially directly below one of the bearing retaining cavities not having an upper restraining tab positioned axially thereover, and each lower restraining tab having a circumferential dimension less than or equal to the circumferential dimension of the bearing retaining cavity below which it is positioned,

the upper restraining tabs serving to restrain in the assembled bearing the inner race from an axial displacement away from its functional position confronting the outer race,

the lower restraining tabs serving to restrain in the assembled bearing the outer race from an axial displacement away from its functional position confronting the inner race,

said upper restraining tabs being sufficiently resilient to allow insertion of the inner race past said tabs to its functional assembled position,

said upper restraining tabs extending radially inwardly from the upper cylindrical shoulder to a radial distance from the axis of the upper and lower cylindrical shoulders not less than the radius of the outside surface of the lower cylindrical shoulder, and

said lower restraining tabs extending radially outwardly from the lower cylindrical shoulder to a radial distance from the axis of the upper and lower cylindrical shoulders less than the radius of the inner surface of the upper cylindrical shoulder.

4,588,315

HEAT-SENSITIVE COLOR TRANSFER RECORDING MEDIA AND PRINTING PROCESS USING THE SAME

Tadao Seto, Odawara, and Yoshikazu Shimazaki, Osaka, both of Japan, assignors to Fuji Kagakushi Kogyo Co., Ltd., Osaka, Japan

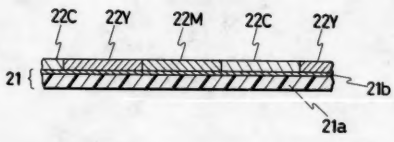
Continuation-in-part of Ser. No. 465,017, Feb. 8, 1983, Pat. No. 4,503,095. This application Dec. 18, 1984, Ser. No. 682,871

Claims priority, application Japan, Feb. 13, 1982, 57-21571; Feb. 13, 1982, 57-21572

The portion of the term of this patent subsequent to Feb. 25, 2003, has been disclaimed.

Int. Cl.[4] B41J *3/20*

U.S. Cl. 400—120 **12 Claims**



1. A heat-sensitive color transfer recording media which comprises foundation comprising an electroresistive layer, adapted to be contacted by an electrode, an electrically conductive layer on one side thereof having a thickness of 30 to 200 nm and a multiplicity of coated areas of heat sensitive transfer inks applied on the other side of the electrically conductive layer of the foundation; the multiplicity of the coated areas being disposed on the continuous foundation side by side so as to transverse the continuous foundation; the multiplicity of the coated areas being arranged sequentially in the longitudinal direction of the continuous foundation in a repeating unit which comprises a plurality of different color coated areas; each of the different color coated areas included in the repeating unit having a length in the longitudinal direction of the continuous foundation substantially equal to one of the length and width of a receiving medium; each of the heat-sensitive transfer ink layers of the coated areas being a transparent ink layer comprising a transparent coloring agent and a transparent hot-melt vehicle; and said plurality of the different color heat-sensitive transfer ink layers of the coated areas of the recording media capable of being transferred onto the receiving medium so that different substantially permanently-existing color ink images are superimposed on the receiving medium to provide a color image.

4,588,316

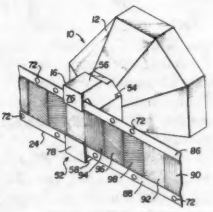
OPTICALLY CONTROLLED MULTI-COLOR IMPACT PRINTER

Seth L. Everett, Jr., Lincroft, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 8, 1985, Ser. No. 721,096

Int. Cl.[4] B41J *35/04, 35/16*

U.S. Cl. 400—248 **18 Claims**



1. A print head assembly for an impact type printing system including means for optically controlling the position of a colored ink segment of a multi-colored inking ribbon in front of the print head, comprising:

a print head having a forward neck portion;

a color code detector housing in the form of a yoke or collar mounted on said forward neck portion of the print head, said housing including a ribbon guide for translating said inking ribbon past the print head and further including optical code detector means comprising at least one optical source and one optical detector selectively located in the upper or lower portion of said housing;

a translatable inking ribbon, including a plurality of ink segments of mutually different colors located in said ribbon guide in front of said optical code detector means and having optical coding means on at least one outer edge which is in registration with said detector means, said detector means being responsive to said coding means to determine which of said plurality of ink segments is in front of the print head and thereafter if need be, selectively translate said inking ribbon in a direction to position a desired color segment in front of said print head.

4,588,317

LEAD OR PEN MARKING DEVICE

Clarence R. Taylor, 28 Woodside Dr., Penfield, N.Y. 14526

Filed Oct. 5, 1984, Ser. No. 657,898

Int. Cl.[4] B43K *19/00, 23/00, 25/00*

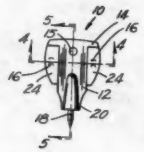
U.S. Cl. 401—131 **7 Claims**

1. A one-piece throw-away marking device moldable from a plastic material comprising:

a straight longitudinally extending plate-like finger gripping body member having front and rear surfaces and parallel spaced apart side edges;

a longitudinally extending boss on said body member at one end thereof having a longitudinally extending blind bore for slidably receiving one end of a lead or pen; and

a pair of elongated spaced apart spring fingers spaced from and substantially parallel to said body member and extending parallel to and laterally outwardly of said side edges for releasably securing the marking device to a support member, each of said spring fingers having one free end and the opposite end thereof integral with the opposite end of said body member.



4,588,318

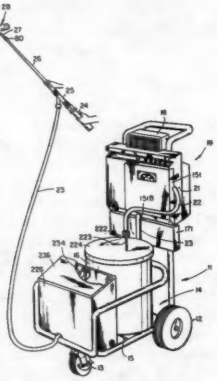
PAINTING APPLICATOR WITH REMOTE TRANSMITTER CONTROL

Lawrence B. O'Brien; Walter F. Winston, both of Carmel; Edmund L. Abner; Lowell G. Atkinson, both of Indianapolis; H. Richard Roudebush, Greenfield; William L. Buehler, Indianapolis; Jim K. Berastresser, Indianapolis, and Walker A. Messick, Indianapolis, all of Ind., assignors to Black & Decker Inc., Newark, Del.

Continuation of Ser. No. 564,726, Dec. 23, 1983, abandoned, which is a division of Ser. No. 218,354, Dec. 22, 1980, Pat. No. 4,424,011. This application Jul. 26, 1985, Ser. No. 758,510

Int. Cl.[4] B05C *17/02*

U.S. Cl. 401—146 **20 Claims**



1. Painting apparatus comprising:

a pump for pumping paint from a reservoir to an applicator;

a conduit coupled from said pump to said applicator, a portion of said conduit being flexible tubing of a length sufficient to enable utilization of said applicator at a location remote from said pump;

remote control signal receiver means, associated with said pump, for controlling operation of said pump;

a handle connected to said applicator to facilitate manipulation of said applicator against a surface to be painted;

remote control signal transmitter means, located in said handle, for sending commands to said receiver means to remotely control said pump from said handle;

manually operable means, on said handle, for operating said transmitter means; and

battery means, in said handle, for providing electrical supply to said transmitter means.

4,588,319

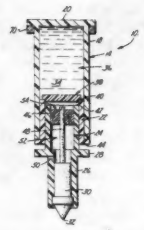
MARKING INSTRUMENT

Robert H. Niemeyer, Concord, Calif., assignor to Nicolet Instrument Corporation, Madison, Wis.

Filed Oct. 25, 1984, Ser. No. 664,530

Int. Cl.[4] B43K *5/00*

U.S. Cl. 401—205 **17 Claims**



1. In combination with a marking instrument of the type having a housing with a marking fluid reservoir therein, vent means for venting the reservoir to ambient air and a marking tip which draws marking fluid from the fluid reservoir, the improvement which comprises:

permeable flow rate control means for creating a desired flow rate of marking fluid from the marking fluid reservoir to the marking tip; and

sealing support means for supporting the flow rate control means in the housing and preventing passage of marking fluid between the reservoir and vent means other than through the flow rate control means.

4,588,320

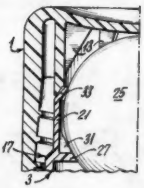
CLOSURE FOR ROLL-ON APPLICATOR

Jack Weinstein, Old Bridge, N.J., assignor to Bristol-Myers Company, New York, N.Y.

Filed Oct. 27, 1980, Ser. No. 200,704

Int. Cl.[4] B43K *7/00*

U.S. Cl. 401—213 **5 Claims**



1. In combination a closure and a dispenser container, said dispenser container comprising a container body having an upper open end and rotatable applicator; said rotatable applicator being removably mounted in the upper end of said container by means of a flexible retaining means, said flexible retaining means being adapted to be urged inwardly toward said rotatable applicator thereby forming a seal sealing the interior of said container from the atmosphere; said closure comprising a cap being provided with an upper inner surface and a lateral inner surface, skirt means provided with an inner surface and depending from and being integral with said upper inner surface of said cap; said skirt means being spaced inwardly of said lateral inner surface of said cap; said skirt means

also being provided with bracing means to prevent deformation of said skirt means when pressure is applied to said skirt means when the said closure is mounted on said dispenser; said bracing means comprising a plurality of radially disposed bracing ribs secured to and extending inwardly of said inner skirt means surface; said skirt means being sufficiently long and adapted to apply pressure on said retaining means to urge the latter against said rotatable applicator means when said closure is in place on said roll-on dispenser.

4,588,321

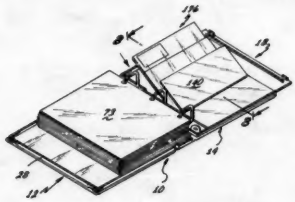
MAGNETIC MEDIA AND PROGRAM CASE

Robert A. Egly, 38 Whitewater Dr., Corona del Mar, Calif.

Filed Jun. 8, 1984, Ser. No. 618,530

Int. Cl.[4] B42F *13/00*

U.S. Cl. 402—77 **10 Claims**



1. A magnetic memory and printed material case comprising:

a first cover;

a second cover;

means for hinging said first and second cover together in the form of a binding having a living hinge and wherein said first and second covers are formed from one piece of plastic;

ring binder means for holding printed material attached to said case; and,

a magnetic media pocket for storing magnetic media on the interior side of one of said covers when they are folded over each other so as to effectuate a holding of magnetic media in combination with printed material formed with a separate molded pocket cover and secured to one of said covers by attachment means thereto.

4,588,322

MOTOR SHAFT BEARING SUPPORT AND DISCONNECT

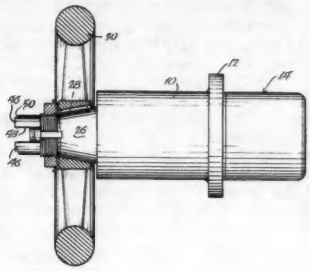
James E. Shoemaker, Glenview, and Gilbert M. Younger, Mt. Prospect, both of Ill., assignors to A. Lakin & Sons, Inc., Chicago, Ill.

Filed Jun. 22, 1984, Ser. No. 623,580

Int. Cl.[4] F16D *1/06*

U.S. Cl. 403—1 **10 Claims**

1. A device for providing a disconnect between a motor having a rotary output shaft and an object to be rotated thereby, said device comprising a second shaft mounted adjacent to the end of the motor shaft coaxial therewith, a spindle around the second shaft, said second shaft being axially slidable in said spindle and in constant rotary driving relation therewith, and disconnect means for providing rotary drive connection and disconnection between said second shaft and motor shaft upon movement of said second shaft toward and away from said motor shaft, said disconnect means comprising a sleeve, one portion of said sleeve being disposed around said motor shaft in constant driving relation therewith, and another



portion of said sleeve being engageable with an end of the second shaft in driving relation.

4,588,323

COUPLING DEVICE

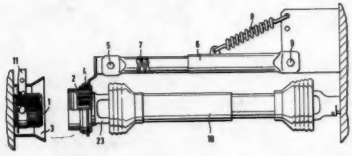
Jürgen Vollmer, Lohmar, and Paul Herchenbach, Ruppichteroth, both of Fed. Rep. of Germany, assignors to Jean Walterscheid GmbH, Lohmar, Fed. Rep. of Germany

Filed Jan. 20, 1984, Ser. No. 572,576

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1983, 3302379

Int. Cl.[4] F16D *3/32*

U.S. Cl. 403—12 **7 Claims**



1. A coupling device for connecting a drive shaft to a power take-off shaft particularly for attaching an agricultural implement in driving engagement with a tractor, comprising:

a drive shaft having a free end and a driven end;

a coupling member located at said free end adapted to couple said drive shaft with a complementary coupling member on a power take-off shaft;

bearing means on said free end of said drive shaft;

a support arm vertically pivotable at one end thereof about a first articulation point associated with said driven end of said drive shaft and having its opposite end pivotally connected about a second articulation point with said free end of said drive shaft through said bearing means;

first spring means connected to provide a spring force applied relative to pivotal motion of said support arm about said first articulation point;

said support arm being constructed as a telescoping member including second spring means applying a spring force acting longitudinally of said support arm.

4,588,324

SLALOM POLE

Hermann Goellner, Stratton Mountain School, Stratton, Vt. 05155

Filed Jan. 9, 1984, Ser. No. 569,458

Int. Cl.[4] E01F *9/01*

U.S. Cl. 404—10 **7 Claims**

1. A slalom pole adapted to be supported in snow, ice and/or the ground, including a lower part adapted to be placed in the

ground and an upper part extending upwardly above the ground and being adapted to pivot against the lower part when subjected to an impact force from a skier in any direction,

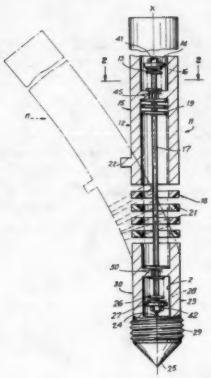
comprising, in combination,

said lower part including a lower portion comprising threading means for anchoring it in an upward position in the snow, ice, and/or ground,

said upper part including an upper portion surmounting the lower portion and normally being aligned therewith and being pivotally movable relative to the lower part over a radius of flexure,

a middle portion disposed between said upper and lower portions and normally aligned therewith and being composed of a series of superposed annular members,

said lower, middle and upper portions normally forming an elongated rod-like structure presenting a substantially continuous external surface,



restoring means operable to urge said upper portion to return to its normal position in alignment with said lower portion, when the upper portion has been pivoted from said normal position, said restoring means comprising

two springs, one of said springs being disposed coaxially with relation to said upper portion and the other spring being disposed coaxially with relation to said lower portion,

a third spring disposed within said annular members of said middle portion, thereby providing said radius of flexure, said third spring being coaxial with said first two springs,

means interconnecting and engaging said first two springs,

said three springs and interconnecting means cooperating to pivot said upper portion about said radius of flexure upon impact from a skier and then to return said pole to an upright position.

4,588,325

MODULAR ROCK REPLACING DRAIN FIELD APPARATUS

Kenneth F. Seefert, 10003 Mendel Rd., Stillwater, Minn. 55082

Filed Jul. 26, 1984, Ser. No. 634,459

Int. Cl.[4] E02B *13/00*

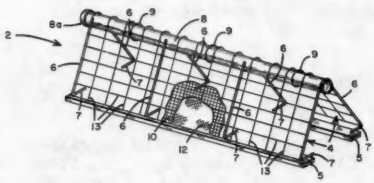
U.S. Cl. 405—46 **22 Claims**

1. In a sewage disposal system apparatus for distributing effluent over the trenched surface of an effluent absorption bed and wherein no filler gravel is required comprising:

(a) a lightweight soil supporting framework including a plurality of rib members coupled to one another to subtend an elongated hollow chamber having an open bottom and ends and mountable in a prepared trench;

(b) a rot resistant, soil supporting first meshwork mounted over said assembled framework, the porosity of said meshwork being dense enough to prevent the infiltration of dirt and rock into the chamber, yet permit evaporation and the permeation of liquid therethrough; and

(c) means suspended within said hollow chamber for receiving and distributing effluent over the surface of the absorption bed;



(d) the effluent thereby being absorbed by the underlying soil and evaporating through the air and liquid permeable walls of said apparatus.

4,588,326

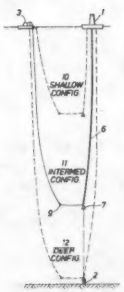
SUBSEA PIPELINE CONNECTION

Carl G. Langner, Spring, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 22, 1983, Ser. No. 564,605

Int. Cl.[4] F16L *1/04*

U.S. Cl. 405—169 **9 Claims**



1. A method for connecting and laying a flowline from a subsea structure on the seafloor comprising:

connecting the flowline from a first vessel to a riser from a second vessel;

deploying the flowline and riser downardly to the subsea structture;

connecting the riser to the subsea structure;

connecting the flowline to the subsea structure;

laying the flowline on the seafloor from the subsea structure; and

disconnecting the riser from both the flowline and the subsea structure.

4,588,327

PRECAST CONCRETE PILE AND METHOD OF PLACING IT IN THE GROUND

Juei J. Lin, 4th Fl., No. 37-39, Sec. 2, Shih Chuan Road, Panchiao City, Taiwan

Filed Feb. 28, 1984, Ser. No. 584,522

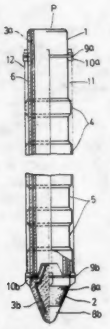
Int. Cl.[4] E02D *5/30, 5/54*

U.S. Cl. 405—244 **3 Claims**

1. A precast concrete pile comprising:

a cylindrical elongated concrete member comprising a conically tapered end and a plurality of enlarged spaced-apart circular cross sectional portions at intervals along the

member which are one piece with the member, each of said enlarged circular cross sectional portions having a groove in a peripheral portion thereof, said groove in one said enlarged circular cross sectional portion being aligned with respective grooves in other said enlarged circular cross sectional portions;



a first longitudinal pipe received in said aligned grooves for delivering water or cement slurry; and

means provided at upper and lower portions of said concrete member for fastening said pipe to said concrete member.

4,588,328

MOVABLE JOINT DEVICE FOR COUPLING A COLUMN, TOWER OR PLATFORM

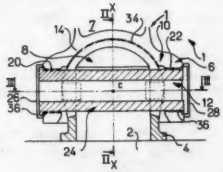
Jean-Pierre R. F. Ghilardi, Bouffemont; René F. Forget, Breval, and Samuel Tuson, Mesnil-le-Roi, all of France, assignors to Entreprise d'Equipements et Hydrauliques (E.M.H), France

Filed Aug. 9, 1983, Ser. No. 521,598

Claims priority, application France, Aug. 17, 1982, 82 14216

Int. Cl.⁴ E02B *17/02*

U.S. Cl. 405—202 **8 Claims**



1. A movable joint device for coupling a column, tower or platform, in particular for the exploitation of sea bottom resources, relative to a base resting on the sea bed, comprising

a male member secured to one of the two elements consisting of the base and the column, respectively and a female member secured to the other element, each member comprising associated assembling means allowing the joint to be obtained by assembling both members in fitting relationship with positive unilateral connection, said members being maintained in the assembling position by means for ballasting the column to ensure a contantly downwardly directed load, whereas said members are disassembled by simply modifying the ballasting means so as to reverse the load and impart it in an upward direction;

said assembling means comprising anti-rotation interfitting means with substantially constant operative engaging surface area for preventing rotation of the male and female members relative to one another around the longitudinal axis of the column,

the assembling means of the female member comprising a sleeve portion, thus forming an advantageously fluid-tight bell which is secured to said column, whereas the assembling means of the male member comprise a ball portion which is secured to the base,

the ball provided with a vertical slot extending from its top down to a point below the centre of its semi-spherical surface and extending diametrically throughout said ball;

the sleeve provided in its body with two coaxial, diametrically opposite openings, the axis of which extends through the centre of its semi-spherical internal surface;

an intermediate member, such as a cylindrical hollow shaft, inserted into said openings and removably secured therein, said intermediate member being so designated that, in the assembled position, it is inserted into said vertical slot so that said structure forms said anti-rotation inter-fitting means.

4,588,329

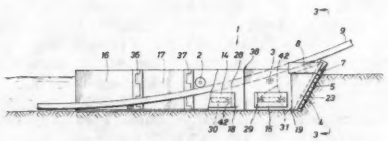
PROPULSION METHOD AND APPARATUS FOR ADVANCING A MARINE PIPELINE EXCAVATION SHIELD

Robert T. Gilchrist, Jr., Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Aug. 17, 1984, Ser. No. 641,629

Int. Cl.⁴ E02D *17/00;* **E21D** *10/00;* **F16L** *1/04*

U.S. Cl. 405—283 **7 Claims**



1. A method for advancing an elongated, segmented excavation shield in a soil trench comprising:

attaching independently movable skin plates to at least part of the shield, the skin plates being located between the shield and a wall of the trench and having lesser surface area than the shield;

advancing at least part of the skin plates by transmitting soil reaction from non-moving skin plates and shield segments to the moving skin plates; and

then moving at least part of the shield segments forward by transmitting soil reaction from non-moving skin plates.

4,588,330

DEVICE FOR STARTING AND BRAKING CONTAINERS AND LOCKING THEM AFTER THEY ARE STOPPED

Adolf M. Alexandrov, ulitsa Chelyabinskaya, 19, korpus 4, kv. 457; Igor I. Volyansky, ulitsa Stratonavtov, 13, korpus 1, kv. 12; Jury A. Yashin, Yaroslavskoe shosse, 59, kv. 55, and Vladimir Y. Tsernes, Kirovogradskaya 24, korpus 3, kv. 204, all of Moscow, U.S.S.R.

PCT No. PCT/SU82/00021, § 371 Date Feb. 2, 1984, § 102(e) Date Feb. 2, 1984, PCT Pub. No. WO84/00145, PCT Pub. Date Jan. 19, 1984

PCT Filed Jun. 25, 1982, Ser. No. 584,948

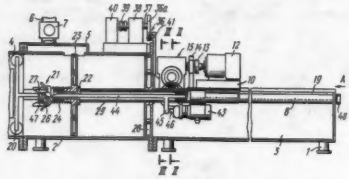
Claims priority, application U.S.S.R., Dec. 28, 1979, 2859224

Int. Cl.⁴ B65G *51/20*

U.S. Cl. 406—83 **6 Claims**

1. A device for starting and braking containers and locking them after they are stopped, used in pneumatic conveyers and comprising a frame mounting a trough adjoining a pipeline and having edges with recesses used as guides of support members of the truck having a drive moving it along the guides and carrying a lever clamp for containers, provided with a cup secured thereon and overlapping the cross-section of the conveyer pipe-line kinematically connected with a drive to provide interaction with the container, the improvement comprising a sleeve (2) of a diameter corresponding to that of the conveyer pipe-line (4), disposed between the trough (3) and the

conveyer pipe-line (4) and having recesses (11) made in the inner wall thereof, disposed at the opposite sides and serving as a continuation of the guides (8) of the trough (3), an additional cup (28) overlapping the cross-section of the sleeve (2), rigidly coupled with the truck (10) and carrying support members (9) disposed on the guides (11), and a rod (29) passing through the



additional cup (28) for which in the central part of the latter there is made a through hole corresponding to the cross-section of the rod (29) whose one end portion is rigidly coupled with the clamp (21) of the other end portion is rigidly coupled with the truck (10) via a locking mechanism (30) mounted thereon.

4,588,331

THROWAWAY-TYPE BALL END MILL AND THROWAWAY TIP USED IN SAME

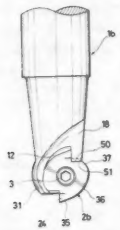
Mizuki Yoshinori, c/o Dijet Industrial Co., Ltd., No. 1-18, Kami-Higashi 2-chome, Hirano-ku, Osaka, Japan

Filed Sep. 7, 1983, Ser. No. 530,126

Claims priority, application Japan, Sep. 16, 1982, 57-140579[U]; Dec. 25, 1982, 57-198722[U]

Int. Cl.⁴ B26D *1/00*

U.S. Cl. 407—36 **10 Claims**



1. A removable cutting insert for a ball end mill, comprising a body having

opposite front and rear surfaces, each having a top and a bottom opposite said top, and opposite first and second sides at the peripheries of said front and rear surfaces extending between said top and said bottom;

a planar cutting edge extending from said bottom in a plane at said front surface, upward along said first side, a convex cutting edge continuous to one end of said planar cutting edge extending convexly on said bottom between said front surface and said rear surface, said planar cutting edge including a bottom cutting edge on said bottom continuous to said convex cutting edge, an arched circumferential cutting edge continuous to said bottom cutting edge extending along the periphery of said front surface at said first side, and a top cutting edge at said top extending from and continuously to said circumferential cutting edge toward said second side, and inclined relief faces extending from said convex and planar cutting edges toward said rear surface;

a first insert-fixing face on said top between said front surface and said rear surface; and

further cutting edges and a second insert-fixing face respectively identical to said first and second cutting edges of said first insert-fixing face, located 180° with respect thereto about a central axis of said insert perpendicular to said front surface, so that said insert may be identically used for cutting in each of two 180° rotated orientations.

4,588,332

SELF-SHARPENING TOOL CONSTRUCTIONS HAVING CHIP-GROOVES

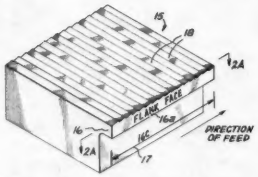
Ranga Komanduri, and William R. Reed, Jr., both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 3, 1982, Ser. No. 438,685

The portion of the term of this patent subsequent to Sep. 10, 2002, has been disclaimed.

Int. Cl.⁴ B23B *27/22*

U.S. Cl. 407—114 **26 Claims**



1. In a cutting tool arrangement in which a tool insert of refractory material is rigidly held in a tool holder, said tool holder being adjustably mounted so as to bring said tool insert into contact with a metal workpiece to alter the shape thereof by the removal of metal therefrom; said tool insert comprising in combination a longitudinally-extending cutting element extending along at least one side of said tool insert to provide flank and rake faces for said tool insert and means for supporting said cutting element formed integrally therewith; said cutting element (a) overhanging said support means to present the flank face of said tool insert a substantially uniform distance in the range of from 20 mils to 80 mils from said support means, (b) having a maximum thickness in the range of from 20 mils to 80 mils, (c) being of substantially uniform transverse cross-section along said length and (d) being progressively consumed along the length thereof during use of said tool insert, the improvement wherein said rake face of said cutting element is modified by the presence of a plurality of longitudinally-extending chip-grooves formed in sequence in said rake face, said chip-grooves extending generally perpendicular to said flank face of said cutting element.

4,588,333

CHIP CUTTING TOOL

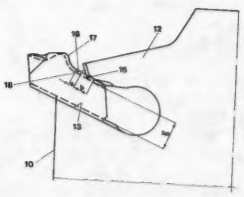
Manfred W. Gustafson, Malmvägen, Sweden, assignor to Seco Tools AB, Fagersta, Sweden

Filed Dec. 5, 1984, Ser. No. 678,584

Claims priority, application Sweden, Feb. 20, 1984, 8400897

Int. Cl.⁴ B26D *1/00*

U.S. Cl. 407—117 **13 Claims**



1. A chip cutting tool, preferably a parting or groove cutting

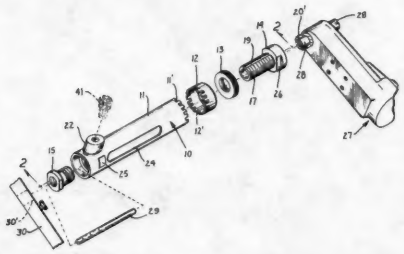
tool, comprising a holder body, a clamping arm attached to said holder body, preferably integrally therewith, a cutting insert, said cutting insert being clamped by means of said clamping arm in an insert site in said holder body between a first supporting surface on the holder body and a second supporting surface on the clamping arm, said clamping arm being adapted to rest against the cutting insert in a generally bent state and clamp the cutting insert by means of the resilient force arising from the bending of the clamping arm, characterized in that an edge surface of the cutting insert opposed to said first supporting surface comprises a plurality of mutually inclined portions, which are intended to slide against said second supporting surface during insertion of the cutting insert into said insert site while simultaneously bending the clamping arm, said portions being mutually designed such that a larger bending of the clamping arm is obtained during an initial phase of the insertion of the cutting insert than during the final phase thereof, and in that the cutting insert is provided with an abutting surface which is adapted to define the final position of the cutting insert in the holder body by abutment against an end surface on the clamping arm.

4,588,334

ADJUSTABLE CLOCKING NOSE PIECE

Sudershan K. Khurana, Marietta, Ga., assignor to Lockheed Corporation, Burbank, Calif.

Filed Sep. 7, 1984, Ser. No. 648,074
Int. Cl.[4] B23B *51/06*
U.S. Cl. 408—61 **8 Claims**



1. A nose piece for a power drill, said drill having a drill motor, a drill spindle, and a drill bit attached to said spindle comprising:

(a) a first housing for enclosing said drill bit and said drill spindle;

(b) means for attaching said housing to said drill motor and varying both the linear and radial relationships between said housing and said drill bit;

(c) bushing means connected on one end to said first housing and on the opposite end to a drill jig so that said drill bit must pass through said bushing means to contact a work piece; and

(d) clocking means for adjusting and fixing the linear and radial positions of said housing with respect to said drill bit and said work piece.

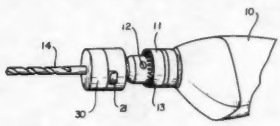
4,588,335

QUICK CHANGE TOOL RETENTION DEVICE FOR POWER OPERATED MECHANISM

Claude C. Pearson, Jr., Rte. 1, Box 145, Irving, Ill. 62051

Filed Sep. 14, 1984, Ser. No. 650,469
Int. Cl.[4] ;23B *31/08*
U.S. Cl. 408—239 R **9 Claims**

1. A quick-change tool retention device for a power-operated mechanism, said device comprising a body member provided with front and rear walls and an external peripheral wall, an interior cavity in said body member, said interior cavity having side walls perpendicular to a longitudinal axis of said body member and a bottom face, said body member further having an axial aperture extending from said front wall into said interior cavity in said body member, attachment means provided by said body member for securing said body member to said power operated mechanism, an aperture in said external peripheral wall extending into said interior cavity perpendicular to said axis of said body member, said body member further provided with an actuator member extending through said aperture in said exterior peripheral wall into said



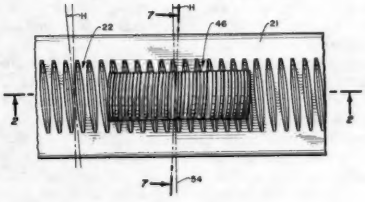
interior cavity, a spring biasing means in said interior cavity abutting the wall of the interior cavity opposing the aperture, said actuator member being associated with said spring-biasing means in said interior cavity and arranged to retain a shank end of a tool inserted through said axial aperture, said spring-biasing means being arranged to move between a first tool-retaining position and a second tool-releasing position upon pressure being applied to said actuator member, whereby a given tool may be quickly installed and removed from said tool retention device.

4,588,336

RACK AND PINION GEAR AND PROCESS OF FABRICATION

Bernard J. Navarro, 4212 Chevy Chase Dr., Glendale, Calif. 90039

Continuation of Ser. No. 472,353, Mar. 4, 1983, abandoned. This application Apr. 19, 1985, Ser. No. 724,797
Int. Cl.[4] B23F *1/06*
U.S. Cl. 409—12 **5 Claims**



1. Process for cutting rack teeth having arcuate roots comprising:

providing a rotatably mounted, conical hob with a substantially uniform semi vertical angle along its entire length and having teeth formed on a helix;

providing an elongate work piece generally parallel to the axis of the hob;

rotating the hob about its axis

longitudinally moving the hob and work piece relative to each other in synchronism with hob rotation, and at a rate dependent upon hob lead;

engaging the smaller end of the hob with the work piece;

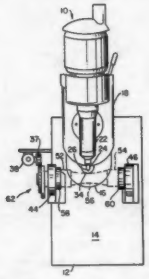
continuing the relative longitudinal movement to cause hob teeth of continuously increasing diameter to cut into the work piece, until the hob has passed completely over the work piece;

thereby forming in the work piece, generally transverse, arcuate, parallel grooves constituting recessed, concave, arcuate roots of rack teeth.

4,588,337
APPARATUS AND METHOD FOR MACHINING AN ENVELOPING-TYPE WORM SCREW

George E. Brackett, Cape Elizabeth, Me., assignor to Maxaxam Corporation, Oradell, N.J.

Filed Mar. 13, 1984, Ser. No. 588,967
Int. Cl.[4] B23F *15/00*
U.S. Cl. 409—48 39 Claims



10. Apparatus for machining an enveloping-type worm screw from a screw blank having an hourglass shape, two opposed ends and a central longitudinal axis, said apparatus comprising first mounting means for mounting said screw blank such that said screw blank is rotatable about a first axis which is coincident with said central longitudinal axis of said screw blank; first positioning means for positioning a first cutter, having a central longitudinal axis, on one side of said screw blank such that said first cutter is pivotable about a second axis arranged at an angle of 90° relative to said first axis, said first cutter being positioned at a predetermined inclined angle relative to a plane which includes said first axis and which is normal to said second axis and said first cutter being positioned such that said central longitudinal axis of said first cutter intersects said central longitudinal axis of said screw blank at a point intermediate said two opposed ends of said screw blank, whereby said central longitudinal axis of said first cutter moves away from said central longitudinal axis of said screw blank, in a direction normal to said plane, when said first cutter is pivoted about said second axis in either direction to thereby move said central longitudinal axis of said first cutter away from said point; first rotating means for rotating said screw blank about said first axis at a first rate; and first pivoting means for pivoting said first cutter about said second axis at a second rate which is less than said first rate, said first cutter being pivoted as said screw blank rotates, whereby said first cutter forms a first hourglass screw thread in said screw blank.

4,588,338
FOLLOWER MECHANISM AND CONTROL FOR ROTARY METAL REMOVING TOOLS

John H. Brems, Apt. 11-G, 2800 S. Ocean Blvd., Boca Raton, Fla. 33432

Filed Mar. 1, 1984, Ser. No. 585,186
Int. Cl.[4] B23C *1/16*
U.S. Cl. 409—124 5 Claims

1. In a contour machining operation in which it is desired to move a cutting tool along a predetermined planar path at a predetermined feed rate, a mechanical system comprising:

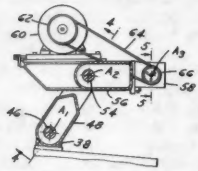
(a) a frame,

(b) movable support means mounted on said frame which supports:

(c) a means for machining comprising a drive motor, a spindle driven by said drive motor, and a work processing tool member mounted on said spindle,

(d) first cam means mounted on said frame,

(e) guide means mounted on said movable support means, axially coincident with said spindle and cooperating with said first cam means to guide said tool member along said predetermined path, and

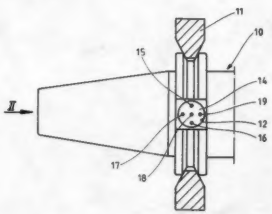


(f) mechanical drive means for driving said guide means along said predetermined path at a constant velocity.

4,588,339
TOOL HOLDER FOR A CUTTING MACHINE PROVIDED WITH NUMERICAL CONTROL

Reiner Bilz, Esslingen, Fed. Rep. of Germany, assignor to Otto Bilz, Werkzeugfabrik, Ostfildern, Fed. Rep. of Germany

Filed Jul. 2, 1984, Ser. No. 626,621
Claims priority, application Fed. Rep. of Germany, Jul. 23, 1983, 3326615
Int. Cl.[4] B23C *5/16;* B23Q *3/155;* G09F *3/08*
U.S. Cl. 409—234 13 Claims



1. In a tool holder provided with a data carrier for various characteristics of a tool, such as its length, diameter, service time, or the like, and employed in conjunction with a machine tool provided with numerical control, the improvement comprising the data carrier including a memory means carrying an electrically erasable programmable read-only memory and being fixedly inserted into the tool holder, said holder being formed with a pocket bore, said memory means being cast within said pocket bore and being secured against loss, said memory means being held in said pocket bore in a predetermined reproducible and fixed-against-rotation position.

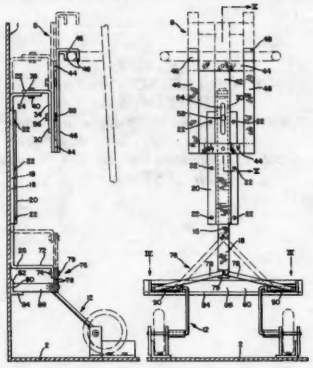
4,588,340
METHOD AND APPARATUS FOR SECURING WHEELCHAIRS

Atlas Howard, 157 Connecticut Ave., Stamford, Conn. 06902

Filed Jun. 17, 1983, Ser. No. 505,311
Int. Cl.[4] B60P *3/06;* B60N *1/02*
U.S. Cl. 410—7 16 Claims

1. An apparatus for interchangeably securing conventional wheelchairs which have two small forward and two large rear spoked wheels and adjustable carriage-type wheelchairs which have a handle and two small forward and two small rear spoked wheels against movement without necessitating modification of the structural configuration of the apparatus, comprising interconnecting means mounted in a substantially vertical position for reciprocating movement in first generally upward and second generally downward directions and having a first upper end and a second lower end, handle locking means mounted on said first upper end for engaging and secur-

ing the handle of carriage-type wheelchairs, wheel locking means for engaging and securing the two rear wheels of conventional and carriage-type wheelchairs and actuator means interposed between and connected to said second lower end and said wheel locking means for translating the reciprocating movement of said second lower end in said first and second directions into generally horizontal reciprocating movement in third and fourth directions, which translated movement is transmitted by said actuator means to said wheel locking means, movement of said interconnecting means in said second direction simultaneously causing said handle locking means to engage and secure the handle of the wheelchair and said actuator means to translate said movement in said second direction into movement in said fourth direction which is transmitted to said wheel locking means, causing said wheel locking means to engage and secure the two rear wheels to thereby prevent movement of the wheelchair, and movement of said interconnecting means in said first direction simultaneously causing said handle locking means to release the handle and said actuator means to translate said movement in said first direction into movement in said third direction which is transmitted to said wheel locking means, causing said wheel locking means to release the two rear wheels, to thereby permit movement of the wheelchair.



4,588,341

ARTICLE DELIVERY APPARATUS

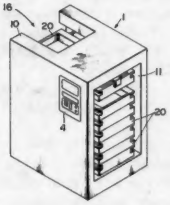
Kenro Motoda, Tokyo, Japan, assignor to Motoda Denshi Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 25, 1984, Ser. No. 624,046

Claims priority, application Japan, Jul. 8, 1983, 58-123395; Sep. 2, 1983, 58-161567

Int. Cl.[4] B65G *60/00*

U.S. Cl. 414—32 **14 Claims**



1. An article delivery/receiving apparatus for delivering-/receiving articles through the use of trays comprising, in combination, a main body adapted to be disposed in the vicinity of a working station in a factory and a carrier containing a stack of trays therein; and said main body including:

a tray loading/unloading portion having a space for encasing said carrier, and where said carrier containing said stack of trays is loaded or unloaded,

an article delivery/receiving portion formed at an upper portion of said main body to allow for cooperation with a working robot or the like, and being disposed in juxtaposition to said tray loading/unloading portion,

a first lift means, for stepwise lifting said stack of trays, and being engageable with the lower most tray of said stack,

an upper lateral means provided at said main body for laterally shifting a tray located at the uppermost position of said stack to said article delivery/receiving portion; and

a second lift means, for stepwise lowering the shifted trays disposed at said article delivery/receiving portion so as to provide for the sequential and stepwise tray circulation within said main body of said apparatus and an article delivery/receiving operation which is repetitive for each sequence or cycle of tray operation.

4,588,342

IC MAGAZINE SUPPLY SYSTEM

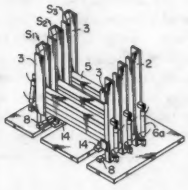
Hideo Hirokawa, Odawara; Seiji Kazama, Hadano, and Hisashi Takashima, Kanagawa, all of Japan, assignors to Hitachi Electronics Engineering Co., Ltd., Kanagawa, Japan

Filed Aug. 5, 1983, Ser. No. 520,688

Claims priority, application Japan, Aug. 13, 1982, 57-139946

Int. Cl.[4] B65G *59/06*

U.S. Cl. 414—125 **10 Claims**



1. An IC magazine supply system for supplying IC magazines to an IC inlet section or an IC outlet section of an IC handler, each said IC magazine holding an array of IC packages therein, comprising:

a plurality of magazine stackers arranged in parallel with a predetermined distance therebetween, each of said magazine stackers being capable of holding a plurality of said IC magazines stacked in a vertical direction, one of said magazine stackers disposed on an operator side supplying its IC magazines in preference to the other magazine stackers;

guide means located under said plurality of magazine stackers for receiving an IC magazine from a selected one of said IC magazine stackers;

a moving section movable vertically and transversely for moving upwardly to an upper position thereof above said guide means to receive the IC magazines from said guide means, for moving said predetermined distance in a first transverse direction to discharge the IC magazine at a leading end thereof, and for moving in a second transverse direction opposite said first direction for said predetermined distance;

a plurality of sensors each mounted on the bottom of one of said plurality of magazine stackers for sensing the condition of movement of the IC magazines, whereby the IC magazines can be supplied successively in order, from a plurality of stackers so that when one of the stacker is depleted, it can be filled while IC magazines are continuously supplied to said guide means from other one of the stackers.

4,588,343

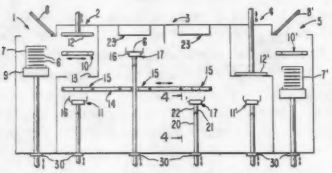
WORKPIECE LIFTING AND HOLDING APPARATUS

Charles B. Garrett, San Jose, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Division of Ser. No. 611,762, May 18, 1984, abandoned. This application Aug. 5, 1985, Ser. No. 762,606

Int. Cl.[4] H01J *5/02*

U.S. Cl. 414—221 **14 Claims**



7. An apparatus for processing workpieces, said apparatus comprising:

wall means forming a loading chamber, a processing chamber having a plurality of processing stations therein, and an unloading chamber;

a shuttle workpiece carrier in said processing chamber;

means for conveying a workpiece in said loading chamber to said shuttle workpiece carrier;

an elevator at each processing station including an elevator pedestal, an elongated lifting support member, means for offsetting said pedestal from said lifting support member, and means for actuating said support member;

a shuttle workpiece carrier having central opening and throat open to one side, with said carrier oriented so that said means for offsetting said pedestal can pass through said throat as the workpiece is raised;

means for moving said shuttle workpiece carrier; and

means for conveying a workpiece from said shuttle workpiece carrier into said unloading chamber.

4,588,344

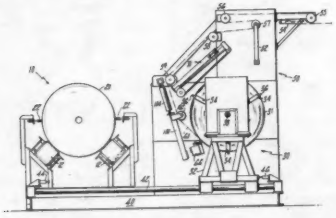
ROLL TRANSFER ROBOT

Steven A. Burke, New Haven, and Christopher Pali, Fort Wayne, both of Ind., assignors to Essex Group, Inc., Fort Wayne, Ind.

Filed Jun. 4, 1984. Ser. No. 617,300

Int. Cl.[4] B65H *1/00*

U.S. Cl. 414—225 **9 Claims**



1. A roll transfer robot for transferring a roll of ribbon material having an outside diameter and an annular core from an unloading position of a conveyor assembly to a chuck means of a payoff assembly which comprises:

frame means suporting a spindle assembly for both rotational and sliding displacement;

locomotion means for displacing the robot between a first position in registration with the unloading position of the conveyor assembly and a second position in registration with the chuck means of the payoff assembly;

rotating means connected to the spindle assembly for effecting rotation thereof;

sliding means connected to the spindle assembly for effecting sliding displacement of the spindle assembly relative to the frame means;

means connected to the spindle assembly for releasably gripping the roll about its exterior diameter such that the paper roll may be rotated and slidably displaced with the spindle assembly; and

means for detecting the position of the beginning end of a roll such that the roll may be oriented as desired when placed on the payoff assembly, said means for detecting including means for energizing the rotating means until the means for detecting detects the position of the beginning end of the roll.

4,588,345

APPARATUS FOR LIFTING AND TRANSPORTING A UNITARY LOAD

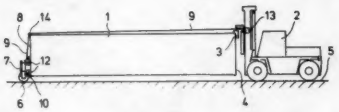
Arjo Anttila, Helsinki, Finland, assignor to Valmet Oy, Finland

Filed Jan. 29, 1985, Ser. No. 696,090

Claims priority, application Finland, Feb. 6, 1984, 840480

Int. Cl.[4] B60P *3/40*

U.S. Cl. 414—458 **9 Claims**



1. In apparatus for lifting a unitary load having a first end and an opposed opposite end, such as a material containing container, from a surface and transporting the unitary load over the surface, said apparatus including transport means for lifting the first end of the load from the surface and separate auxiliary means provided with wheels for carrying the opposite end of the load during transport, the improvement comprising:

said auxiliary means includes propelling means

control means for said propelling means for directing movement of said auxiliary means to the opposite end of the load; and wherein

said auxiliary means includes means for gripping and then lifting the opposite end of the load for subsequent transport of the load.

4,588,346

POSITIONER FOR MAINTAINING AN OBJECT IN A SUBSTANTIALLY WEIGHTLESS CONDITION

Nathan R. Smith, Vincentown, N.J., assignor to InTest Corporation, Cherry Hill, N.J.

Continuation of Ser. No. 411,311, Aug. 25, 1982, Pat. No. 4,527,942. This application Jun. 5, 1985, Ser. No. 741,608

The portion of the term of this patent subsequent to Jul. 9, 2002, has been disclaimed.

Int. Cl.[4] B25J *1/12*

U.S. Cl. 414—673 **5 Claims**

1. A system for maintaining an object in a substantially weightless condition without the effect of gravity comprising

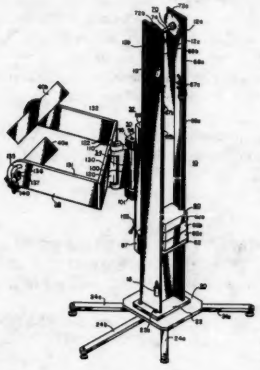
support means,

positioner means coupled to the support means and having vertical movement with respect to the support means and movement in the horizontal plane, the positioner means including means for attaching the object,

counterbalancing means coupled to the positioner means to provide substantially weightless condition to the positioner means with the object attached, and

the positioner means and the support means including at least three parallel continuously vertical axes so that as the positioner means is extended in the horizontal plane, the

three vertical axes themselves support the weight of the positioner means with the object and two of the three vertical axes being simultaneously free to rotate about



their respective axes as the positioner means is manually rotated about said two vertical axes without the effect of gravity, at least one of said two vertical axes being free of vertical movement with respect to the positioner means.

4,588,347

TELESCOPIC BOOMS

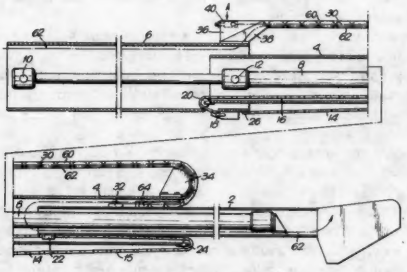
Raymond Murta, Warrington, England, assignor to Coles Cranes Limited, Crown Works, England

Filed Sep. 22, 1982, Ser. No. 421,547

Claims priority, application United Kingdom, Oct. 2, 1981, 8129852

Int. Cl.⁴ B66C *15/00*

U.S. Cl. 414—685 **13 Claims**



1. An access platform apparatus comprising:

a body,

a plurality of wheels attached to said body,

a telescopic boom supported by said body and comprising at least:

a base boom section mounted to said body,

an intermediate boom sectionry telescopically mounted within said base boom section, said sectionry comprising at least one intermediate boom,

an outer boom section telescopically mounted within said intermediate sectionry,

first extension means arranged to extend said intermediate sectionry,

second extension means arranged to extend said outer boom section,

a first anchorage on a lower portion of said outer section,

a guide at or adjacent an outer end of said intermediate sectionry,

a second anchorage located in a direction from the outer end of said intermediate sectionry towards said body,

flexible safety retaining means, extending between said first and second anchorage and around said guide, for halting relative movement of said outer boom section and said intermediate sectionry upon failure of said second extension means.

4,588,348

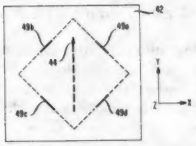
ROBOTIC SYSTEM UTILIZING A TACTILE SENSOR ARRAY

Gerardo Beni, Old Bridge; Susan Hackwood, Freehold, and Lawrence A. Hornak, Ocean, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 27, 1983, Ser. No. 498,908

Int. Cl.⁴ B66C *1/42*

U.S. Cl. 414—730 **5 Claims**



1. A robotic system comprising

a robot having a movable robot part for handling an object,

a tactile sensor incorporated in said part so as to generate an electrical signal in response to forces applied thereto by said object, and

means responsive to said signal for controlling said movable robot part,

said tactile sensor comprising an array of tactile elements each of which includes a layer of a compliant medium, means forming a magnetic dipole embedded in said medium, and adjacent said dipole a plurality of magnetoresistive sensors oriented at essentially 90° to one another and at essentially 45° to said dipole.

4,588,349

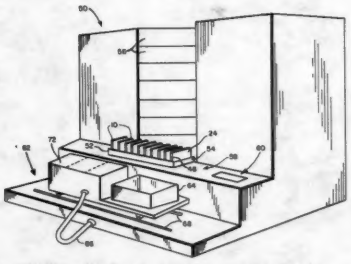
ROBOTIC ORDER PICKING

Howard A. Reuter, Pasadena, Md., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Continuation-in-part of Ser. No. 518,275, Jul. 28, 1983, abandoned. This application Apr. 5, 1985, Ser. No. 720,126

Int. Cl.⁴ B65G *65/00*

U.S. Cl. 414—786 **1 Claim**



1. A method of packaging, storing, and retrieving a plurality

of component parts of a kit to fill an order for said kit, said method comprising the steps of:

a. placing said plurality of component parts into a plurality of identically structured, configured, and dimensioned component parts containers, each of said containers having an open top closeable with a slideably movable lid;

b. closing the open top of each of said containers by sliding said movable lid into a closed position on said open top, thereby enclosing said component parts within said container, whereby said small component parts are thereby packaged;

c. placing said containers being closed in a plurality of open storage trays;

d. storing said storage trays with said container placed therein in an automatic storage and retrieval apparatus of the type which, upon command, is capable of automatically storing said storage trays in storage locations within said apparatus, and which, upon another command, is capable of automatically retrieving said storage trays from said storage locations and delivering a selected storage tray to a transfer location, whereby said small component parts are thereby stored, but retrievable;

e. positioning an open-top kit box adjacent to said transfer location;

f. retrieving automatically, when an order is received for said kit, said selected storage tray from said automatic storage and retrieval apparatus, whereby said selected storage tray is automatically delivered to said transfer location;

g. removing, with a robot means, a selected container from said selected storage tray;

h. positioning, with said robot means, said selected container in an inverted, lid-down orientation in a position over said open-top kit box;

i. slideably retracting, with said robot means, said slideably movable lid of said selected container, whereby when said selected container is opened, a desired number of said component parts fall from said selected container and drop into said kit box;

j. closing said selected container by moving said lid;

k. replacing said selected container into said selected storage tray by said robot means;

l. returning said selected tray to said storage location;

m. repeating the necessary steps above until said order for said kit is filled; and

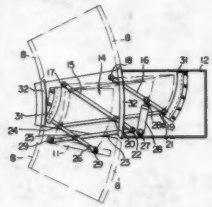
n. replacing said kit box after being filled with an empty kit box.

4,588,350

ARTICLE TRANSPORTING APPARATUS

Taro Iwamoto, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 24, 1982, Ser. No. 423,444
Claims priority, application Japan, Sep. 30, 1981, 56-153709
Int. Cl.⁴ G21C *11/06*
U.S. Cl. 414—787 **10 Claims**



1. An article transporting apparatus for inserting an article into a port of a vessel and removing said article from said vessel through said port and for transporting said article in a direction transverse to said inserting and removing direction within said vessel, said apparatus comprising:

a frame movable into and out of said vessel through said port along said inserting and removing direction and provided with guide means carrying and guiding said article;

a parallel link means mounted on said frame and adapted to transport said article in a direction transverse to the direction of movement of said frame;

a driving means provided between said parallel link means and said frame in order to drive said parallel link means; and

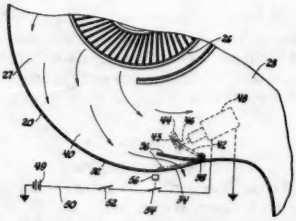
a connecting means provided at the end of said parallel link means for connecting the end of said parallel link means to said article.

4,588,351

CENTRIFUGAL-TYPE AIR BLOWER BLEED-OFF ARRANGEMENT

Larry D. Miller, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 21, 1984, Ser. No. 652,719
Int. Cl.⁴ F01B *25/00*
U.S. Cl. 415—47 **1 Claim**



1. A vehicle defrost system for delivering heated air to a vehicle windsheild, said system including a centrifugal air blower having an impeller, a scroll-type blower housing having a fluid flow path therein, and a discharge duct, the improvement comprising:

an automatic bleed-off valve means, including a valve positioned in an outer wall of said blower housing and having a flap disposed to extend into said fluid flow path when said valve is open, and disposed to be substantially flush with said outer wall of the blower housing when said valve is closed,

an electric motor operative to move said flap in the range between said extended position and said substantially flush position, thereby opening and closing said valve,

and a control means for said motor, including a mode switch and a thermal switch, said mode switch being activated when a defrost mode is manually selected, said thermal switch being activated when outside temperature falls below a pre-determined sub-freezing value, said control means being actuated to extend said flap only when both of said switches are activated.

4,588,352

MULTISTAGE HYDRAULIC MACHINE

Takuya Kako, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 10, 1985, Ser. No. 721,910
Claims priority, application Japan, Apr. 12, 1984, 59-71770; Apr. 12, 1984, 59-71771
Int. Cl.⁴ F04D *29/00*
U.S. Cl. 415—110 **15 Claims**

1. A multistage hydraulic machine comprising:

a main shaft;

plural runners ranging from a highest pressure stage runner

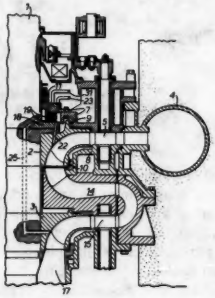
to a lowest pressure stage runner mounted on said main shaft;

a top cover mounted on a predetermined part of a back portion of the highest pressure stage runner;

top cover side runner sealing means for providing sealing between the top cover and the highest pressure stage runner;

a main shaft sealing device provided between an outer surface of the main shaft near where the highest pressure stage runner is mounted and an inner surface of the top cover opposing said main shaft outer surface;

an intermediate sealing device provided between said top cover side runner sealing means and said main shaft sealing device for providing sealing between the top cover and the highest pressure stage runner;



a first passage provided in the highest pressure stage runner for providing communication between a water flow passage of the highest pressure stage runner and a first back portion space located between said top cover side runner sealing means and said intermediate sealing device;

first means for exhausting air provided with said top cover thereby to communicate with said first back portion space;

a second passage providing communication between a water flow passage of the lowest pressure stage runner and a second back portion space located between said main shaft sealing device and said intermediate sealing device;

second means for exhausting air in communication with said second passage;

whereby said first and second passages and said intermediate sealing device prevent water at the pressure within said highest pressure stage runner from communicating with said main shaft sealing device.

4,588,353

SUBMERSIBLE PUMP

Tomoyuki Shibata, and Mitsuhito Nakayama, both of Kanagawa, Japan, assignors to Ebara Corporation, Tokyo, Japan

Filed May 18, 1984, Ser. No. 611,985

Claims priority, application Japan, May 24, 1983, 58-77973[U]

Int. Cl.⁴ F04D *29/42*

U.S. Cl. 415—197 **5 Claims**

1. A submersible pump comprising:

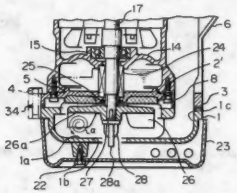
(a) a motor section having a motor encased within a motor frame;

(b) a pump section having a pump casing and a semi-open type impeller including a shroud mounted on the distal end of a motor shaft extending from said motor into said pump casing;

(c) an intermediate casing fastened to said motor frame by a plurality of bolts the heads of which bear against the side of said intermediate casing opposite said motor frame, said pump casing being mounted on the side of said intermediate casing opposite said motor frame and having a hole therethrough which permits said motor shaft to extend therethrough from said motor to the interior of said pump casing; and

(d) a protecting member disposed between said intermediate casing and said pump casing, said protecting member having a surface which opposes the backside of the shroud of said impeller, said protecting member being made of wear-resistant material and being sized, shaped, and positioned to surround the heads of said bolts, the surface of said shroud which opposes the backside of the shroud of said impeller being canted relative to said protecting member so that the radial outer edge of said shroud is spaced from said protecting member by a larger distance than is the radial inner edge of said shroud, said protecting member comprising:

(i) a radially inner portion including the surface of said



protecting member which opposes the backside of the shroud of said impeller, the surface of said protecting member which opposes the backside of the shroud being recessed to form a concave flat surface, and

(ii) an annular flange which extends radially outwardly from said radially inner portion, said annular flange in turn being divided into a radially outer portion and a radially inner portion, the radially outer portion of said annular flange serving as a seal packing between said pump casing and said intermediate casing and the radially inner portion containing a plurality of holes each one of which surrounds the head of one of said bolts, said annular flange, said intermediate casing, and said pump casing being sized and shaped so that said pump casing sealingly closes said plurality of holes, preventing liquid from entering said holes during use of the submersible pump.

4,588,354

ENGINE SPEED CONTROL IN PROPELLER PITCH CONTROL SYSTEMS

Jerome G. Duchesneau, Andover, and Robert A. Schwartz, Vernon, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Aug. 5, 1983, Ser. No. 520,659

Int. Cl.⁴ B64C *11/40*

U.S. Cl. 416—27 **6 Claims**

1. A pitch control system for a variable pitch propeller powered by an engine, said pitch control system including an actuator connected to the blades of said propeller for movement thereof in pitch change directions; said pitch control system being characterized by:

an engine speed governor;

first signal means for establishing a first variable control signal indicative of a desired pitch setting;

means operatively connecting said engine speed governor to said first signal means for setting said first signal means in response to the output of said engine speed governor under normal engine operating speeds;

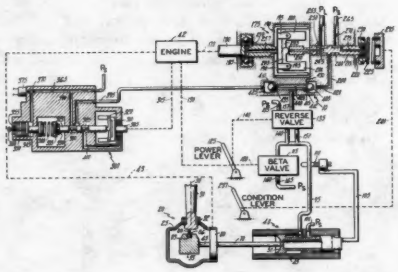
a backup governor;

second signal means for establishing a second variable control signal indicative of a desired pitch setting;

means operatively connecting said backup governor to said second signal means for setting said second signal means in

response to said backup governor under engine overspeed conditions;

connection means connecting said first and second signal means to said actuator for application of said first and second control signals thereto from said first and second signal means; and



said connection means including control means responsive to said first and second control signals, for isolating said first and second control signals from one another and passing a single one of said control signals to said actuator in response to the relative magnitude of said control signals.

4,588,355

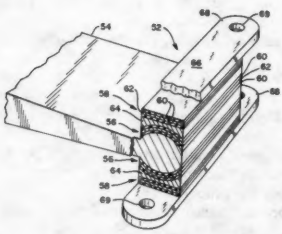
FLEXIBLE SWASHPLATE CENTERING MEMBER

Donald L. Ferris, Newtown, and Michael J. Marchitto, Orange, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Aug. 23, 1984, Ser. No. 644,000

Int. Cl.[4] B64C *27/35, 27/605*

U.S. Cl. 416—114 **3 Claims**



1. A centering member attaching the stationary ring of a helicopter swashplate concentrically about the rotorshaft to the airframe, comprising:

flexible elongated members disposed radially to the rotorshaft, each attached at one end to the airframe; and

attachment means for attaching the other end of each elongated member articuably and elongatably to the stationary ring.

4,588,356

HELICOPTER ROTOR

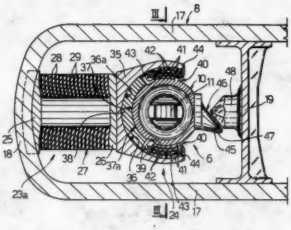
Emilio Pariani, Cardano al Campo, Italy, assignor to Costruzioni Aeronautiche Giovanni Agusta S.p.A., Cascina Costa di Samarate, Italy

Filed Dec. 5, 1983, Ser. No. 558,182

Claims priority, application Italy, Dec. 6, 1982, 68427 A/82

Int. Cl.[4] B64C *27/35, 27/51*

U.S. Cl. 416—140 **4 Claims**



1. An articulated rotor for helicopters comprising a rotary hub mounted for rotation about an axis, said hub being substantially flat in shape and extending substantially in a plane perpendicular to said axis of rotation and comprising a number of radial arms and a number of peripheral bridging elements extending in said plane and connecting the free ends of said arms to one another to define a cavity between each pair of adjacent arms, a number of blades extending radially of said hub, and articulated linkage means connecting each of said blades to said hub, said articulated linkage means comprising, for each of said blades, a substantially U-shaped forked element extending about a respective said bridge element and through a respective said cavity, a radial-thrust type elastomeric bearing, and a damper controlling the movements of said blades in said plane; said elastomeric bearing and said damper being arranged in series between the respective bridge and fork elements, and each said damper consisting of a further elastomeric bearing.

4,588,357

HYDRAULIC THROTTLE CONTROL

William E. McGraw, Hastings-on-Hudson, and Daniel E. Stegner, Smithtown, both of N.Y., assignors to Power Draulics-Nielsen, Inc., Mount Vernon, N.Y.

Filed Jul. 24, 1984, Ser. No. 633,932

Int. Cl.[4] F04B *49/00, 49/08*

U.S. Cl. 417—34 **12 Claims**

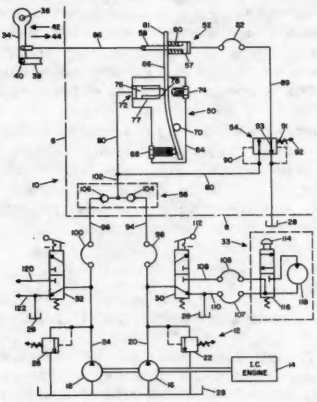
1. An improved hydraulic throttle control apparatus for automatically regulating the flow rate of a fixed displacement hydraulic pump driven by an internal combustion engine having a throttle for adjusting engine speed and spring means attached to the throttle for returning the throttle to its idle speed position, said control apparatus comprising:

a control member connectable to the throttle for actuating the throttle;

a first control means, responsive to outlet pressure of the pump, for maintaining said control member in and idle position responsive to pump pressures below a first predetermined value, and for urging said control member into a high-speed position responsive to pump pressures higher than said first predetermined value; and

a second control means, actuated responsive to outlet pressure of the pump being higher than a second predetermined value, which second value is higher than said first value, for moving said control member from said high-speed position to a position intermediate said idle and high-speed positions, wherein at pump pressures below said second predetermined value said second control means remains unactuated;

whereby the engine RPM and the flow-rate of a pump controlled by said apparatus is low when the pump outlet pressure is below said first value, high when the pump



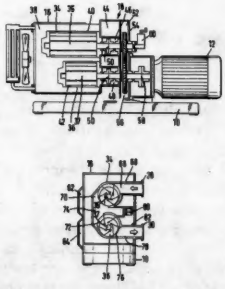
outler pressure is between the first and second values, and intermediate when the pump outlet pressure is higher than the second value.

4,588,358

ROTARY VANE EVACUATING PUMP

Werner Rietschle, Schopfheim, Fed. Rep. of Germany, assignor to Werner Rietschle Maschinen-und Apparatebau GmbH, Schopfheim, Fed. Rep. of Germany

Filed Jul. 2, 1984, Ser. No. 627,193
Int. Cl.[4] F04C *23/00, 29/00*
U.S. Cl. 417—247 **15 Claims**



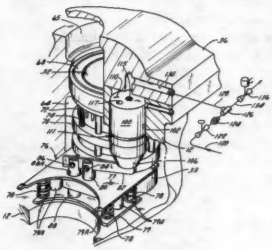
1. A rotary vane fluid evacuating pump comprising
at least one pumping stage including a rotor received in a generally cylindrical bore of a housing and carrying vanes cooperating with said cylindrical bore, said housing including fluid inlet and outlet ports and lubrication oil inlet and outlet connections;
motor means having a driving member for rotationally driving said rotor of said pumping stage within said housing;
coupling means for detachably interconnecting said rotor and said driving member;
a cooling system including means for defining a cooling liquid flow along at least a portion of said housing; and
an interface flange having at least one face and a plurality of internal fluid passages, said housing including a mounting flange for mounting said housing on said one interface flange face, said mounting flange including a plurality of internal passageways providing fluid communication between the fluid ports and lubricating oil connections of the housing and corresponding fluid passages in the interface flange; and
an outer shell detachably mounted to said one face of said interface flange;
wherein said pumping stage is provided as an exchangeable unit, said housing being detachably mounted to said one face of said interface flange and being contained in a chamber defined between said interface flange and said outer shell, said chamber being at least partially filled with said cooling liquid and said cooling liquid surrounding and contacting at least a substantial portion of said housing, whereby said housing is cooled by the cooling liquid and said housing inlet and outlet ports and said housing lubrication oil inlet and outlet connections extend through said mounting flange and to communicate with associated passageways formed in said interface flange.

4,588,359

COMPRESSOR CAPACITY CONTROL APPARATUS

Robert C. Hikade, Sussex, Wis., assignor to Vilter Manufacturing Corporation, Milwaukee, Wis.

Filed Dec. 24, 1984, Ser. No. 685,848
Int. Cl.[4] F04B *49/02*
U.S. Cl. 417—298 **2 Claims**



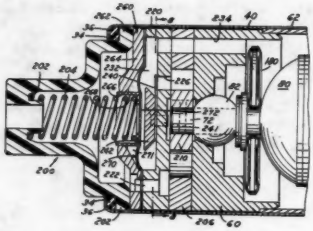
1. In a gas compressor:
a compressor frame;
a hollow cylindrical compressor cylinder rigidly mounted on said compressor frame;
a movable suction valve member which is adjustably movable to control gas flow to said compressor cylinder to thereby control loading and unloading of the compressor cylinder;
and unloader means to effect movement of said suction valve member and comprising:
a lifting arm pivotally connected at a fixed location relative to said compressor frame and having a free end and being connected to effect movement of said suction valve member;
an unloader cylinder on said compressor frame;
and a cover plate overlying said compressor cylinder and said unloader cylinder and detachably connected to said frame;
an unloader piston having upper ad lower ends and having a piston ring therearound and slidably mounted in said unloader cylinder and resting on and bearing against said free end of said lifting arm for effecting movement of said lifting arm in response to fluid pressure in said unloader cylinder indicative of a load condition in said compressor, said unloader piston being accessible when said cover plate is detached from said frame to enable withdrawal of said unloader piston from said unloader cylinder.

4,588,360

ROTARY FUEL PUMP WITH PULSE MODULATION

Charles H. Tuckey, Cass City, Mich., assignor to Walbro Corporation, Cass City, Mich.

Division of Ser. No. 573,285, Jan. 23, 1984, Pat. No. 4,521,164.
This application Mar. 25, 1985, Ser. No. 715,728
Int. Cl.[4] F04B 11/00; F04C 2/00; F16L 55/04
U.S. Cl. 417—366 2 Claims



1. In a rotary fuel pump which includes an elongate housing with an inlet at one end and an outlet at the other end, a rotary pump at the inlet end, and an electric motor rotating on the axis of said housing within the housing having a drive shaft connected to said pump to drive the pump, that improvement which comprises:

(a) a pump outlet discharging into said housing in the area of said electric motor and communicating with said outlet end of said housing,

(b) an annular pulse reducing chamber disposed transversely of the axis of said housing and located in said housing between said pump and said electric motor surrounding said drive shaft,

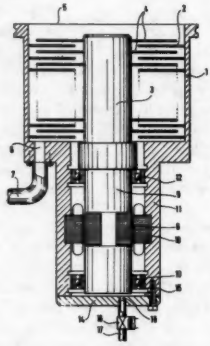
(c) said chamber being exposed to the outlet pressure in the area of said motor and comprising a sealed toroidal annular chamber formed of axially spaced radial flexible walls connected at the inner and outer peripheries by short axially extending telescoping portions hermetically sealed to provide the sealed chamber.

4,588,361

HIGH VACUUM ROTARY PUMP

Claude Saulgeot, Veyrier-du-Lac, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Jul. 5, 1985, Ser. No. 751,908
Claims priority, application France, Jul. 5, 1984, 84 10681
Int. Cl.[4] F04B 17/00; F01D 1/36; F16J 15/40
U.S. Cl. 417—424 2 Claims



1. In a high vacuum rotary pump comprising; a pump rotor rotatably mounted in a pump stator, said stator having a suction end and an exhaust end, said exhaust end being pierced by an exhaust orifice for connection to the suction end of a primary pump, a sleeve extending from the exhaust end of said stator and having the same internal pressure as the exhaust end of the stator, a motor housed in said sleeve, said motor including a motor rotor, said pump rotor being drivably coupled to said motor rotor, said rotors of said motor and pump being supported by bearings, and the far end of the sleeve from its end adjacent to the pump stator being closed by an end plate, the improvement comprising: an orifice within one of said sleeve and said end plate for rapidly returning the stator to atmospheric pressure so as to avoid oil vapor being introduced into the stator from the primary pump when the pump is stopped, said orifice including a valve responsive to pump operation to close during operation of the pump and to open only when the pump is stopped.

4,588,362

REVERSIBLE UNIDIRECTIONAL FLOW ROTARY PUMP

Robin E. Child, Leamington Spa, United Kingdom, assignor to Concentric Pumps Limited, Erdington, United Kingdom

PCT No. PCT/GB84/00306, § 371 Date Jan. 21, 1985, § 102(e) Date Jan. 21, 1985, PCT Pub. No. WO85/01086, PCT Pub. Date Mar. 14, 1985
PCT Filed Sep. 3, 1984, Ser. No. 695,866
Claims priority, application United Kingdom, Sep. 8, 1983, 8324116
Int. Cl.[4] F04C 2/10, 15/02
U.S. Cl. 418—32 1 Claim

1. A reversible unidirectional flow gerotor pump comprising an externally toothed rotor journaled on a fixed axis, and an annulus having a cylindrical outer surface and having internal teeth in mesh with the externally toothed rotor, wherein the improvement comprises a carrier having an elongated cavity at one end of which is a semi-cylindrical surface in which said annulus has a running fit, and a housing in which said carrier has a pivot in line with the middle of said semi-cylindrical surface, said housing limiting the movement of said carrier to permit said carrier to pivot between two positions in which the axis of said cylindrical annulus is on opposite sides of the axis of said rotor.

4,588,363

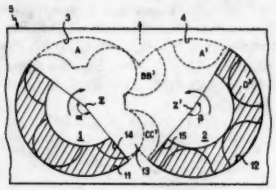
VOLUMETRIC SCREW COMPRESSOR

Jean-Jacques Carre, Le Raincy, and Roland Levrai, Stains, both of France, assignors to Societe Anonyme D.B.A., Paris, France

Filed Mar. 18, 1985, Ser. No. 713,358
Claims priority, application France, Mar. 28, 1984, 84 04841
Int. Cl.[4] F01C 1/16, 1/24
U.S. Cl. 418—201 11 Claims

1. A screw compressor, which comprises, in a casing having a peripheral wall and opposite end walls, a male rotor and a female rotor rotating around parallel axes in intercommunicating rotor chambers, inlet passage means formed in a first of said

opposite end walls, and an outlet passage adjacent a second of said opposite end walls, wherein said inlet passage means consists of two separate annular sectors disposed apart from one another and centered respectively on said axes, the annular



sectors each having an opening angle of less than 200° and being substantially symmetrical relative to a plane of intersection of said rotor chambers, and each annular sector having an adjacent radial edge separated from the other adjacent radial edge by a central portion of said first end wall.

4,588,364

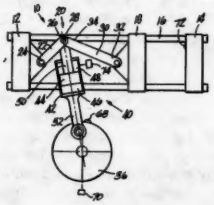
CLAMP MECHANISM

Robert D. Schad, Toronto, Canada, assignor to Husky Injection Molding Systems Ltd., Bolton, Canada

Filed Apr. 1, 1985, Ser. No. 718,803

Int. Cl.⁴ B30B *11/02*; B29F *1/06*

U.S. Cl. 425—135 **32 Claims**



1. A transmission assembly for moving a first member relative to a second member and selectively locking and unlocking said first member in a first position at a predetermined distance from said second member comprising a linkage system connecting said first member and said second member, drive means for articulating said linkage system for moving said first member relative to said second member, connecting means for transferring motion from said drive means to said linkage system and locking means associated with said linkage system for locking said first member in place relative to said second member at said predetermined distance, said locking means comprising a fluid link.

15. A reciprocating press comprising a support, a fixed platen and an abutment, said fixed platen and said abutment being connected on said support such that said fixed platen is spaced from said abutment, a movable platen mounted on said support between said fixed platen and said abutment, said movable platen being movable between a first position wherein said movable platen abuts said fixed platen and a second position wherein said movable platen and fixed platen are apart, a transmission assembly for moving said movable platen between said first position and said second position, said transmission assembly comprising a linkage system connecting said movable platen and said abutment, drive means for articulating said linkage system for moving said movable platen relative to said abutment and said fixed platen, connecting means for transferring motion from said drive means to said linkage system and locking means associated with said linkage system for locking said movable platen in place when said movable platen is in said first position, said locking means comprising a fluid link.

4,588,365

INJECTION MOLDING ASSEMBLY

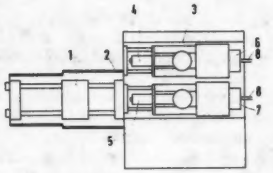
Johann Holzschuh, Meinerzhagen, Fed. Rep. of Germany, assignor to Battenfeld Maschinenfabriken GmbH, Fed. Rep. of Germany

Filed Oct. 1, 1984, Ser. No. 656,669

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1983, 3337546

Int. Cl.⁴ B29C *45/07*

U.S. Cl. 425—183 **8 Claims**



1. An injection molding assembly, which comprises:

a tool unit; and

two extruder units mounted on a frame member, each of said extruder units including drive means and capable of being operatively connected to said tool unit, said extruder units being spatially-disposed from one another on said frame member, said frame member positioned for transverse movement with respect to said tool unit whereby when one of said extruder units is operatively connected to said tool unit, said other of said extruder units is not operatively connected to said tool unit.

4,588,366

ROTATION GRANULATOR

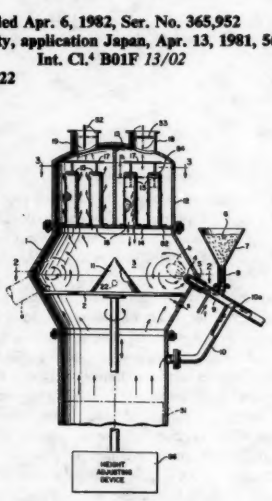
Werner Glatt, D-7851 Binzen Loerrach (BRD), Fed. Rep. of Germany

Filed Apr. 6, 1982, Ser. No. 365,952

Claims priority, application Japan, Apr. 13, 1981, 56-55463

Int. Cl.⁴ B01F *13/02*

U.S. Cl. 425—222 **3 Claims**



1. A rotation granulator comprising:

a granulator casing defining a granulator space, said casing

having a lower opening and an upper opening communciating with said space;

means for causing air to pass through said granulator space and out said upper opening;

means for introducing particles of powder into said passing air;

a hollow casing through the interior of which a sample of processed material passes, said hollow casing having an inlet communicating with said granulator space, said hollow casing also having an outlet;

a receiving container for receiving said sample of processed material, said container having an inlet communicating with said outlet of said hollow casing, said container also having an outlet;

cover means for selectively closing said container outlet to hold said sample within said container and opening said container outlet to remove said sample from within said container; and

valve means movably mounted within said hollow casing for selectively closing said inlet of said hollow casing to isolate said granulator space from the interior of said hollow casing and opening said inlet of said hollow casing to permit said sample of processed material to pass from said granulator space, through the interior of said hollow casing and into said receiving container.

4,588,367

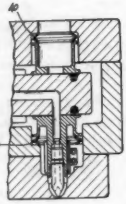
HOT RUNNER MANIFOLD FOR INJECTION MOLDING MACHINE

Robert D. Schad, Toronto, Canada, assignor to Husky Injection Molding Systems Ltd., Bolton, Canada

Filed Jul. 16, 1984, Ser. No. 630,970

Int. Cl.[4] B29F *1/03*

U.S. Cl. 425—549 **11 Claims**



1. In a hot runner for pressure molding having a floating manifold disposed between at least two spaced abutments, said manifold having a plurality of conduits communicating with and contacting mating nozzles set in one of said abutments, means for sealing the manifold relative to said nozzles comprising:

a first thermal expansion support element integral with each nozzle disposed between the manifold and said one abutment, said element being spaced from said abutment and in contacting relationship with said manifold, a second thermal expansion support element between the manifold and the other of said spaced abutments in contacting relationship with said manifold, and spring means disposed between the support elements and mating abutments, whereby heat generated in operation of said manifold is conducted to the nozzle and to the first thermal expansion support element causing the element to expand into contact with said one abutment to clamp and seal the nozzle tightly between said abutments and to establish full compressive support between said nozzle, abutments and manifold.

4,588,368

APPARATUS FOR PRODUCING MOLDED ARTICLES FROM A POURABLE COMPOUND

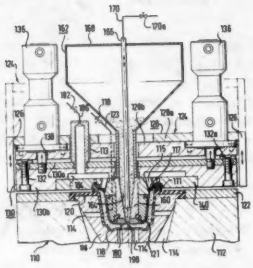
Eugen Bühler, Schleifweg 3, D-8871 Burtenbach; Klaus Strobel, Selb, and Karl Schwarzmeier, Selb-Oberweissenbach, all of Fed. Rep. of Germany, assignors to Eugen Bühler, Burtenbach and Hutschenreuther AG, Selb, both of, Fed. Rep. of Germany

Continuation of Ser. No. 397,067, Jul. 12, 1982, abandoned. This application May 9, 1984, Ser. No. 608,501

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1981, 3128348

Int. Cl.[4] B28B *3/02, 13/02*

U.S. Cl. 425—546 **9 Claims**



1. Mold and press unit for producing molded articles from a dry, flowable porcelain substance, comprising a first mold and press unit (**110**) and a second mold and press unit (**130**),

(a) said first mold press unit (**110**) and said second mold press unit (**130**) define a mold and press space (**190**) therebetween, said mold and press space having a circumferential edge encircling said mold and press space;

(b) said first mold press unit comprises a compression membrane (**118**) forming a part of said mold and press space and said compression membrane has an edge (**120**) extending radially outwardly from said mold and press space;

(c) said compression membrane (**118**) having one surface forming a part of said mold and press space and an opposite second surface, and said first mold and press unit (**110**) includes a support plate (**116**) supporting the opposite second surface of said compression membrane;

(d) said support plate (**116**) having compressed medium channels (**114'**) opening to the second surface of said compression membrane and a pressure chamber (**114**) in communication with the second surface of said compression membrane (**118**) through said channels so that pressure can be built up against the second surface;

(e) said second mold and press unit (**130**) includes a precompression die (**140**) located on the opposite side of said mold and press space from said compression membrane (**118**) and forming a part of said mold and press space;

(f) a first fluid-actuated power means (**136**) in communication with said precompression die (**140**) for pressing said die against said edge (**120**) of said compression membrane (**118**);

(g) said precompression die (**140**) having a supply duct (**164**) therethrough centrally arranged relative to said mold and press space for supplying a flowable porcelain substance into said mold and press space, said supply duct secured to said precompression die;

(h) said second mold and press unit (**130**) includes suction means (**117, 115, 184, 186**) extending around the circumferential edge of said mold and press space and annularly around the space outwardly from said supply duct (**198**);

(i) an annular precompression membrane (**121**) located on the surface of said precompression die (**140**) facing said mold and press space, said precompression membrane (**121**) extending annularly around said supply duct (**164**)

and extending outwardly therefrom toward the inlets (117) of said suction means (117, 115, 184, 186) into said mold and press space;

(j) a pressure fluid line (123) is connected to the space between said precompression die (140) and said precompression membrane (121);

(k) control means are provided for:

(aa) effecting contact pressure of said precompression die (140) on said edge (120) of said precompression membrane (118) by activating said first fluid actuating power means (136);

(bb) subsequently applying a vacuum at said suction means (117, 115, 184, 186) for permitting the entry of flowable porcelain substance through said supply duct (164) into said mold and pressure space; and

(cc) subsequently effecting a pressure increase in the space between said precompression die (140) and said precompression membrane (121) by activating said pressure fluid line (123) while maintaining said pressure chamber (114) in an essentially pressure free condition.

4,588,369

APPARATUS FOR REMOVAL OF A DATA CARRIER DISK AFTER MOLDING

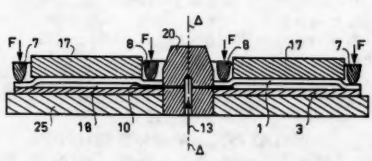
Roger Rascle, and Francois Langé, both of Paris, France, assignors to Thomson-CSF, Paris, France

Division of Ser. No. 414,310, Sep. 2, 1982, Pat. No. 4,500,486. This application Nov. 19, 1984, Ser. No. 673,147

Claims priority, application France, Oct. 6, 1981, 81 18788

Int. Cl.[4] B29D *17/00*

U.S. Cl. 425—437 **14 Claims**



1. An apparatus for removing a molded record disk of the type having a substrate coated with a layer of a hardened molding agent carrying in an annular area are thereof a relief impression of surface irregularities which are copied into the layer prior to removal of the record disk, said apparatus comprising:

a planar disk shaped stamping die including surface irregularities to be copied into the record disk layer, said molding agent layer being disposed between said substrate and said recorded surface;

clamping means for clamping an outer annular portion of the molded record disk against the recorded surface to form a seal at said outer portion and to thereby establish, between said recorded surface and one surface of said substrate, an air-tight inflatable chamber which includes said annular area, said clamping means for preventing escape of a pressurized fluid from the inflatable chamber;

duct means having an opening in fluid communication with said inflatable chamber for allowing the pressurized fluid to pass into said inflatable chamber, said fluid responsively causing said annular area to bend; and

cover plate means in confronting relationship with the other surface of said substrate and defining therewith a gap, said cover plate means for controling the amount of bending of said annular area by virtue of said established gap upon inflation of said inflatable chamber by said pressurized fluid, wherein the controlled bending of said annular area effects an annular loss of contact between said annular area and said molded record disk.

4,588,370

DEVICE FOR REMOVING AND CONVEYING INJECTION-MOLDED PIECE

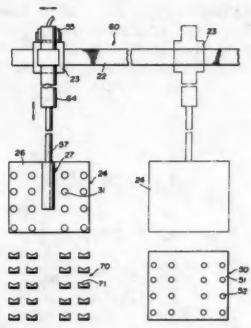
Yoshiyuki Ichizawa, Sohka; Tsugio Nomoto, Higashi Kurume, and Mamoru Oshida, Funabashi, all of Japan, assignors to Yoshino Kogyosho Co., Ltd., Tokyo, Japan

Division of Ser. No. 32,970, Apr. 24, 1979, Pat. No. 4,514,166. This application Sep. 5, 1984, Ser. No. 647,540

Claims priority, application Japan, Apr. 24, 1978, 53-48573; Apr. 24, 1978, 53-48575; Apr. 24, 1978, 53-54350

Int. Cl.[4] B29C *45/38*

U.S. Cl. 425—526 **13 Claims**



1. An automatic device for removing injection-molded bottomed cylindrical preforms for bottle-shaped blow-molded containers from an injection molding-machine and to a biaxial orientation blow molding machine each preform as removed from the injection molding machine having a gate integrally projecting from the bottom thereof, said device comprising:

removing means, supported horizontally movably along a rail installed over the injection molding machine and elevationally movable, for removing the preforms from said injection molding machine, said removing means comprising holding means for releasably gripping said preforms in the injection molding machine by the gates of the preforms, said holding means comprising first and second relatively slidable plates with holes perforated therethrough and sliding means for relatively slidably moving said first and second plates, whereby said gates are gripped after insertion through corresponding holes in said first and second plates by relative sliding movement of said first and second plates;

gate cutting means for cutting said gates from said bottoms of said preforms removed by said removing means; and

cooling means enclosed by a cover plate for cooling the gate-less preforms with cooling air fed from a cooling air inlet.

11. An automatic device for removing injection-molded bottomed cylindrical preforms for bottle-shaped blow-molded containers from an injection molding machine and to a biaxial orientation blow molding machine, each preform as removed from the injection molding machine having a gate intregrally projecting from the bottom thereof, said device comprising:

removing means, supported horizontally movably along a rail installed over the injection molding machine and elevationally movably, for removing the preforms from the injection molding machine;

gate cutting means for cutting said gates from said bottoms of said preforms removed by said removing means; and

cooling means for cooling the gate-less preforms with cooling air, said cooling means comprising:

an endless belt for receiving preforms from said gate cutting means and continuously conveying preforms thereon to a preform delivery position;

a cover substantially enclosing said endless belt, said

cover having a cooling air inlet formed therein for admitting cooling air; and

an air scattering plate having a plurality of holes perforated therethrough, said plate being disposed between said air inlet and a side of said conveyor which conveys said preforms, said holes in said plate being arranged such that substantially no holes are formed in said plate adjacent said air inlet.

4,588,371

SAFETY DEVICE FOR POT-TYPE OIL BURNER

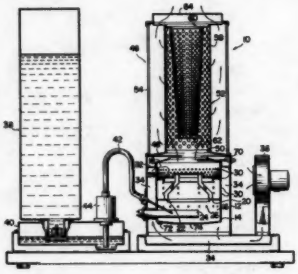
Kazuharu Nakamura; Motoki Matsumoto; Tooru Yoshino, all of Nagoya, and Osamu Niha, Aichi, all of Japan, assignors to Toyotomi Kogyo Co., Ltd., Aichi, Japan

Filed Mar. 23, 1984, Ser. No. 593,009

Claims priority, application Japan, Mar. 29, 1983, 58-53030

Int. Cl.⁴ F23N *5/26*

U.S. Cl. 431—14 **13 Claims**



1. A safety device for a pot-type oil burner comprising:

a thermo-sensitive device arranged on the outer surface of the bottom of the pot of said burner for vaporizing and burning fuel oil supplied to said pot, said thermo-sensitive device being positioned so as to detect the temperature of a bottom portion of said pot apart from a bottom region of said pot in which occurs the vaporization of said fuel oil supplied to said pot; and

a combustion stop mechanism which actuates to stop combustion when the temperature detected by said thermo-sensitive device is below a set temperature;

the temperature of said bottom portion of said post being positively related to the oxygen concentration in room supplying combustion air to said pot when burning said fuel oil therein;

said thermo-sensitive device comprising a thermistor having a negative temperture coefficient; and,

said combustion stop mechanism comprising a pump control circuit for actuating a fuel pump serving to supply fuel oil to said pot and a burner thermo-circuit for supplying a stop signal to said pump control circuit, said burner thermo-circuit including said thermistor.

4,588,372

FLAME IONIZATION CONTROL OF A PARTIALLY PREMIXED GAS BURNER WITH REGULATED SECONDARY AIR

Ralph H. Torborg, Minnetonka, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 23, 1982, Ser. No. 421,926

Int. Cl.⁴ F23N *5/12*

U.S. Cl. 431—78 **4 Claims**

1. A gas burning furnace comprising

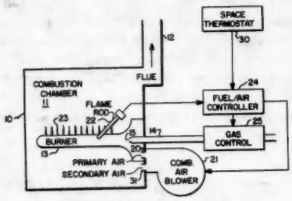
a gas burner mounted in a combustion chamber, said combustion chamber having an exhaust outlet adapted to be connected to a flue,

a gas inlet to said burner connected to a gas control adapted to receive gas from a gas source,

a primary air inlet of said burner connected to an air supply means supplying primary air to said burner to mix with said gas received by the burner to provide a premixed gas go air ratio for burning of said gas,

ignition means for igniting said premixed gas and air mixture,

control means responsive to an ionization current of the burner flame, said ionization current produced by a sensor means, wherein said sensor means has a characteristic maximum value for said ionization current at a premixed



gas and air mixture of said burner where incomplete combustion due to a shortage of primary air exists, said control means being connected to said gas control to control said gas and said ratio of gas to primary air supply to maintain said ionization current at said maximum value, and

a secondary air inlet to said combustion chamber connected to said air supply means, said secondary air inlet being sized with respect to said primary air inlet to proportionally maintain an excess air in said combustion chamber for complete combustion of said gas in said combustion chamber.

4,588,373

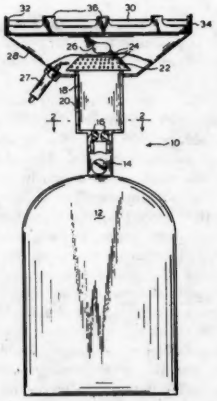
CATALYTIC CAMPING STOVE

Thomas Tonon, Princeton, N.J.; Claudio Bruno, Milan, Italy, and Michael D. Leshner, Columbia, Md., assignors to David Landau, Arlington, Va.

Continuation of Ser. No. 627,433, Jul. 3, 1984, abandoned. This application Sep. 23, 1985, Ser. No. 779,302

Int. Cl.⁴ F23D *14/12*

U.S. Cl. 431—328 **9 Claims**



1. A catalytic stove comprising:

a fuel/air mixing chamber for generating a fuel/air mixture and having an inlet and an outlet;

A diffuser surrounding the chamber outlet;

a plate overlying the diffuser, said plate having an inner face, an exit face opposed to and spaced away from said inner face and a grid of openings interconnecting said faces for passing the fuel/air mixture from the mixing chamber; preheating means for preheating said plate;

said inner face being directed toward said chamber; and

said exit face directed away from said chamber, said plate being provided with a catalytic coating only on said exit face and extending minutely into the openings as compared to the overall length of the grid for generating flameless heat by catalytic combustion of the fuel/air mixture substantiallay at said exit face only without directly heating the inner face due to the thickness of the plate.

4,588,374

DEVICE FOR CONTROLLING THE FLOWRATE OF A LIQUEFIED-GAS LIGHTER

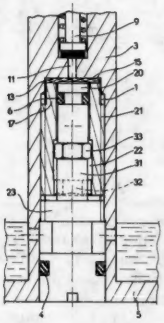
Honoré Calgaro, and Claude Grossiord, both of Annecy, France, assignors to S. T. Dupont, Paris, France

Filed Mar. 26, 1984, Ser. No. 593,321

Claims priority, application France, Apr. 1, 1983, 83 05461

Int. Cl.[4] F23D *13/04*

U.S. Cl. 431—344 **6 Claims**



1. A system for setting the flowrate of a gas from a gas supply circuit of a burner of a liquified gas lighter, the gas supply including a cavity communicating with the burner, a permeable elastic disk disposed in the gas supply circuit of the burner, said permeable elastic disk arranged at an end shoulder portion of the cavity for compression by first and second compression means activated by a common control element, said first compression means comprising an annular element having a base, said annular element having a threaded portion on an outer surface thereof for screwing the annular element into a threaded portion of the cavity so as to compress an annular portion of the disk against said shoulder portion upon rotation of the annular element, said second compression means comprising a central compression element arranged within the annular element, said control element having a portion arranged for communication with the central compression element to compress central portions of the disk, said control element including means to engage the annular element, said control element having a threaded portion on an outer surface portion of the control element for screwing the control element into the cavity so that by turning the control element, the control element can be moved between a presetting and a setting position, so that in said presetting position, the central compression element is disengaged from the disk and the engaging means engage the annular element whereby the annular element can be rotated to compress only said annular portion of the disk, while in said setting position, the engaging means are decoupled from the annular element and the control element can exert an axial compressive force on the central compression element to thereby compress only central portions of the disk.

4,588,375

OIL BURNER

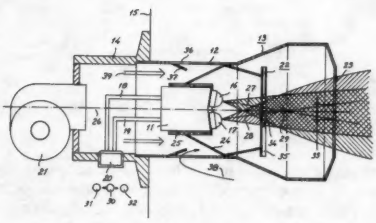
Christer Sandström, Tulevägen 9, S-182 62 Djursholm, Sweden

Filed Apr. 30, 1984, Ser. No. 605,056

Continuation of PCT SE83/00300 filed Aug. 25, 1983, now abandoned

Int. Cl.[4] F23D *14/62*

U.S. Cl. 431—354 **10 Claims**



1. An oil burner of the high pressure type having a number of burner nozzles (16, 17) mounted in a burner housing (14), each nozzle (16, 17) adapted to eject a concentrated high pressure jet of oil which is decomposed into a body (7', 8') of separate oil drops each body (7', 8') having a central axis (27, 28) extending axially through the center of said nozzles (16, 17), means (21) for having combustion air (39) flow through said burner housing past said burner nozzles (16, 17), said oil burner characterized by:

a flame cup (13) having a larger cross sectional area than the burner housing (14) and a forwardly located outlet opening (23) having a smaller cross sectional area than said housing cross sectional area, said flame cup (13) having a throat (12) directly connected to the burner housing (14) and extending coaxially therewith, the oil drop bodies (7', 8') and the combustion air being mixed to an intimate fuel-air mixture within said flame cup,

a turbulator (22) having a center hole (34) for passage therethrough of the oil drop bodies (7', 8') and tubulator wings (35) arranged around said center hole for imparting an axial screw movement to the passing combustion air, said turbulator being located between the burner nozzles (16, 17) and the outlet opening (23) so that the turbulator hole (34) is substantially tangential to the periphery of the oil drop bodies, and

the burner nozzles (16, 17) being arranged symmetrically around the longitudinal axis (26) of the burner housing (14) and mounted at an angle relative to one another to cause the central axis (27, 28) of the oil bodies (7', 8') to cross each other substantially along the longitudinal axis (26) at a point between the turbulator (22) and the outlet (23) of the flame cup (13).

4,588,376

ELECTRIC SIGNAL TRANSFER SYSTEMS

Joseph H. Tyson, Culcheth; Leslie P. Kennett, Croft, and Iain S. Davidson, Ingal, all of England, assignors to British Nuclear Fuels plc, Risley, England

Filed Apr. 1, 1985, Ser. No. 718,117

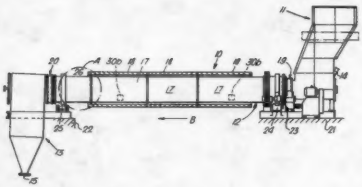
Claims priority, application United Kingdom, Apr. 13, 1984, 8409640; Dec. 17, 1984, 8431755

Int. Cl.[4] F27B *1/26*; G01K *1/08, 7/00*

U.S. Cl. 432—36 **15 Claims**

1. A rotary kiln having a plurality of sensing means thereon, and an electric transfer system for transferring electric signals from the sensing means to a stationary receptor, the transfer system comprising a plurality of co-axial, electrically conduct-

ing, substantially annular members, a respective electrically conductive contact member for each annular member arranged to contact a laterally facing peripheral surface of the respective annular member, the annular members and the contact members being arranged such that rotation of the rotary kiln causes relative rotation between the annular members and the contact members, and means for causing longitudinal displacement of the contact members corresponding to any longitudinal displacement of the annular members, said displacement means comprising a ring member co-axial with and longitudinally displaceable with the annular members, a translational member upon which the contact members are mounted and extending parallel to the axis of the rotary kiln, and a guide member mounted on the translational member, the guide member being located about the ring member so as to cause translational movement of the translational member corresponding to any longitudinal displacement of the ring member.



4,588,377

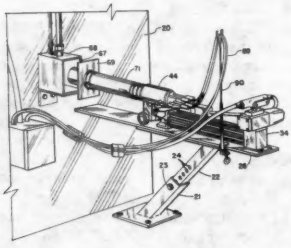
THERMOCOUPLE PROBE ASSEMBLY

Thomas F. Kohn; Lester L. Garland, both of Belding, and Eugene D. Nelson, Belmont, all of Mich., assignors to Belco Industries, Inc., Belding, Mich.

Filed Jan. 24, 1985, Ser. No. 694,596

Int. Cl.[4] F27D *19/00;* **C21B** *7/24;* **G01K** *7/00*

U.S. Cl. 432—50 **6 Claims**



1. A thermocouple probe assembly for sensing the temperature of heated billets, including guideway means adapted to extend toward and away from a billet position, carriage means moveable on said guideway in response to an actuator, said assembly also including elongated insulating means, and probe electrodes mounted on said carriage and extending through said insulating means toward said billet position, wherein the improvement comprises:

a construction of said probe electrodes in which relatively short replaceable tip sections are respectively joined to permanent shank sections in threaded engagement at junctions disposed within said insulating means, one of said sections having an exteriorly threaded end portion engageable with an interiorly threaded end portion on the other of said sections whereby the exterior diameter of said sections remains constant.

4,588,378

CONTINUOUS HEAT TREATING FURNACE FOR METALLIC STRIP

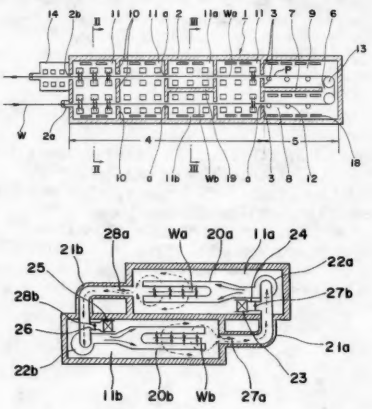
Tadashi Yamamoto, Takarazuka; Masato Nagata, Ikoma, and Tomoyuki Oba, Toyonaka, all of Japan, assignors to Chugai Ro Co., Ltd., Osaka, Japan

Filed Nov. 15, 1984, Ser. No. 671,631

Claims priority, application Japan, Nov. 18, 1983, 58-218313

Int. Cl.[4] F27B *9/28, 9/14*

U.S. Cl. 432—59 **3 Claims**



1. A continuous heat treating furnace for a metallic strip which comprises:

an elongated housing (**2**);

a first partition wall (**3**) extending across the width of the elongated housing to divide the housing into a pre-cooling/pre-heating zone (**4**) and a heat/soaking zone (**5**);

a second partition wall (**10**) extending across the width of said housing to divide said pre-heating/pre-cooling zone (**4**) into a plurality of pre-heating/pre-cooling chambers (**11**), at least one of said pre-heating/pre-cooling chambers (**11**) being further divided into a sectioned pre-cooling chamber (**11***a*) and a sectioned pre-heating chamber (**11***b*) by a section wall (**19**) extending in the lengthwise direction of the elongated housing;

said first and second partition walls each having a pair of metallic strip passing openings (a) therein;

a metallic strip turning means (**13**) located in said heating-/soaking zone (**5**) for receiving an entering metallic strip (W), reversing its direction and exiting the metallic strip from said zone;

a first nozzle header means (**20***a*) located in said pre-cooling section and having a first circulation fan (**22***a*) with an input duct and an output duct for directing atmospheric gas unto opposite surfaces of the metallic strip (Wa);

a second nozzle header means (**20***b*) located in said pre-heating section (**11***b*) and having a second circulation fan (**22***b*) with an input and an output duct for directing atmospheric gas unto opposite surfaces of the metallic strip (Wb);

a first duct (**21***b*) communicating between said pre-cooling section (**11***a*) and said input duct of said second fan (**22***b*) in said pre-heating section (**11***b*), said first duct having an open/close damper (**28***a*) located therein;

a second duct (**21***a*) communicating between said pre-heating section (**11***b*) and said input duct of said first circulation fan (**22***a*) in said pre-cooling section (**11***a*), said second duct having an open/close damper (**27***a*) located therein;

a cooler means (**23**) located in said pre-cooling section and

having an open/close damper (27*b*) located in said inlet duct which connects said cooler means with said input duct of said first circulation fan;

a heater means (25) located in said pre-heating section and having an open/close damper (28*b*) located in said inlet duct which connects said heater with said input duct of said second circulation fan; and

characterized by open and closed states for said open/close dampers in said ducts for exchanging heated air from said pre-cooling section to said pre-cooling section and exchanging cooled air from said pre-heating section to said pre-cooling section or, in the alternative, for circulating air only in said pre-heating and in said pre-cooling sections when said heater means and said cooler means are operating.

4,588,379

CONFIGURATION FOR TEMPERATURE TREATMENT OF SUBSTRATES, IN PARTICULAR SEMI-CONDUCTOR CRYSTAL WAFERS

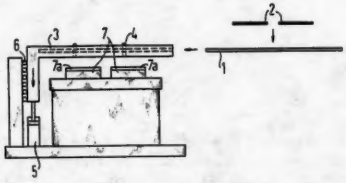
Reiner Sigusch, Munich, and Ludwig Wipper, Germering, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 2, 1984, Ser. No. 576,299

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1983, 3305934

Int. Cl.⁴ F24J *3/00*

U.S. Cl. 432—231 **13 Claims**



1. Configuration for temperature treatment of planar substrates, in particular semiconductor crystal wafers comprising:

(a) a carrier for storing said substrates therein;

(b) a frame-like support for receiving said carrier, said support being connected to a time-controlled compressed air cylinder and being shiftable by means of a roller guide in a direction normal to a first plane corresponding to the surface of said planar substrate;

(c) a temperature controlled heating device arranged below said frame-like support which holds said carrier; and

(d) a vacuum suction configuration connected with said heating devices.

4,588,380

ORTHODONTIC APPLIANCE

Douglas E. Toll, Kronberger Str. 10, 6232 Bad Soden/Taunus Postfach 1504, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 421,800, Sep. 23, 1982, abandoned. This application Jul. 16, 1984, Ser. No. 631,279

Int. Cl.⁴ A61C *7/00*

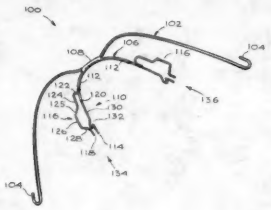
U.S. Cl. 433—5 **3 Claims**

1. An orthodontic appliance including an inner bow intended to be received in a user's mouth, an outer bow intended to extend around the user's face and having a center portion affixed to a center portion of said inner bow, and a strap connected to the ends of said outer bow intended to engage the user's head to pull said outer bow to precisely move first and second rear teeth of the user;

said inner bow being formed of manually deformable spring wire material and including first and second arms each extending substantially rearwardly from said inner bow center portion to a free distal end;

each of said first and second arm distal ends having a noncircular cross section;

first and second tubular members respectively secured to said first and second rear teeth, said tubular members defining internal passageways of noncircular cross section for respectively snugly receiving the distal ends of said



first and second arms to enable said teeth to be precisely bodily moved; and

means formed on each of said first and second arms between said inner bow center portion and the arm's distal end displaced outwardly from, and elongated along, a line substantially conforming to the user's jaw for engaging the inner side of the user's cheek to hold the cheek away from at least some of the teeth between the user's front teeth and said first and second rear teeth.

4,588,381

UNIVERSAL PIN FOR ORAL IMPLANTOPROSTHESIS

Francesco Caracciolo, Via Sangallo, 2, Milan, Italy

Filed Nov. 10, 1983, Ser. No. 550,572

Claims priority, application Italy, Jan. 14, 1983, 19104 A/83

Int. Cl.⁴ A61C *8/00*

U.S. Cl. 433—173 **3 Claims**

1. A pin for oral implantoprosthesis comprising:

a first element for insertion into a hole in the bone of a patient, said first element having an elongated cylindrical body with an opening extending axially therethrough, the opening having three parts;

an upper part in which the inner and outer walls are inclined to define a frusto-conical upwardly facing interior;

a center cylindrical part in which the inner and outer walls are parallel and a lower part which is externally cylindrical and internally conical with at least two axially extending slots dividing the lower part into at least two portions which can be spread mutually apart;

a second element having a lower portion for insertion into the opening of said first element and an upper portion for insertion into the prosthesis, said lower portion having three parts corresponding to the three parts of the opening with an upper part having a frusto-conical exterior of a

size and shape to mate precisely with the corresponding part of the opening, a central cylindrical part of a size and shape to mate precisely with the central cylindrical part of the opening and a lower part which is of a size and shape to engage the internally conical surface of the opening and force the walls thereof radially outwardly to deform the externally cylindrical lower part of the first element into an outwardly tapered shape when the lower portion of the second element is inserted into the opening of the first element.

4,588,382

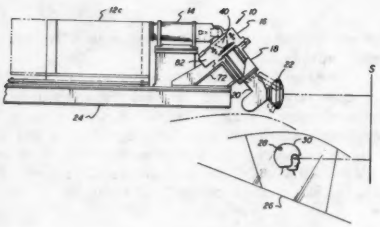
WIDE ANGLE AREA-OF-INTEREST VISUAL IMAGE PROJECTION SYSTEM

David L. Peters, Whitney Point, N.Y., assignor to The Singer Company, Binghamton, N.Y.

Filed Jan. 26, 1984, Ser. No. 573,986

Int. Cl.[4] G09B *9/08*

U.S. Cl. 434—44 **11 Claims**



8. A wide-angle visual image image projection system for providing a high-intensity visual image positionable in azimuth and elevation relative to a predetermined point on a display screen comprising:

at least two light projectors, each providing a separate visual image that comprises a segment of the final image to be displayed;

means for abutting the images from said projectors into a single composite image;

azimuth gimbal;

elevation gimbal;

projection lens mounted on said azimuth gimbal and said elevation gimbal to permit movement of said projection lens in azimuth and elevation; and

optical relay means for relaying said composite image along the azimuthal and elevational axes of said gimbals to said projection lens.

4,588,383

INTERACTIVE SYNTHETIC SPEECH CPR TRAINER/PROMPTER AND METHOD OF USE

William S. Parker, New Haven, and Harold M. Stillman, Stamford, both of Conn., assignors to The New Directions Group, Inc.

Filed Apr. 30, 1984, Ser. No. 605,593

Int. Cl.[4] G09B *5/06;* **A61H** *31/00*

U.S. Cl. 434—265 **12 Claims**

1. A hand portable interactive prompter device for prompting a human operative to carry out sequential steps included in different sequences of a technique, said device comprising:

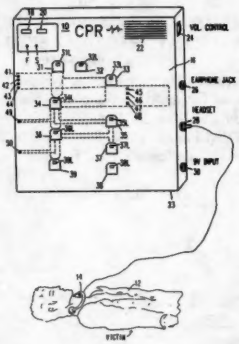
programmed processor means storing representations of each step in each sequence, including pauses separating predetermined successive steps, and programmed to retrieve a particular sequence in response to input signals supplied thereto and to repeat selected sequences in the absence of said input signals;

speech synthesizer means coupled to said processor means for generating audible sounds, including voice prompts, in response to at least some of the representations included in a retrieved sequence, and for producing pauses in response to pause representations; and

plural manually operable selector means each being individually operated by said human operative to supply a respective input signal to said processor means for selecting a particular sequence to be retrieved, the particular selector means that is operated being a function of the response of said human operative to said audible sounds and voice prompts;

whereby the human operative carries out the steps in a sequence of said technique as enunciated by said audible sounds and voice prompts, operates a selector means as instructed by the enunciations to initiate another sequence of steps and fails to operate a selector means so as to cause a sequence to be repeated.

2. An interactive method of training and/or prompting a



human operative to carry out different sequences of steps of a technique, said method comprising the steps of:

retrieving from storage means a particular sequence of representations of the steps included in that sequence;

synthesizing from at least some of said representations audible sounds, including voice prompts, to instruct said human operative of respective steps in said technique to be performed by said human operative;

providing pauses following at least some of said audible sounds and voice prompts;

generating a signal as a function of the response of said human operative to selected ones of said audible sounds and voice prompts;

using the generated signal to retrieve a sequence of representations of the steps included in a particular sequence; and

repeating a sequence of representations in the absence of a generated signal.

4,588,384

FIXED-STAR PROJECTING MACHINE FOR PLANETARIUM

Kenji Shiba, Toyohashi, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Apr. 17, 1985, Ser. No. 724,132

Claims priority, application Japan, Apr. 18, 1984, 59-78210

Int. Cl.[4] G09B *27/00*

U.S. Cl. 434—286 **5 Claims**

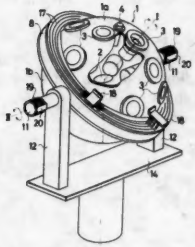
1. A fixed-star projecting machine for a planetarium comprising;

a fixed-star projection globe having auxiliary parts disposed along one great circle of the globe and rotatable about a rotary axis extending at right angle to said great circle,

a plurality of regions by which a surface of said fixed-star projection globe is divided,

first projecting means disposed in some of said divided re-

gions extending across said great circle and projecting the fixed stars in a star region corresponding to the respective divided regions where the first projecting means are disposed, optical axes of the first projecting means being shifted from each center of their respectively divided regions toward said rotary axis,



second projecting means disposed in other part of said divided regions for projecting the fixed stars in a star region corresponding to the respective regions where the second projecting means are disposed, optical axes of the second projecting means coinciding with each center of their respectively divided regions.

4,588,385

WATER COOLED, FOUR-CYCLE INTERNAL COMBUSTION ENGINE FOR OUTBOARD MOTORS

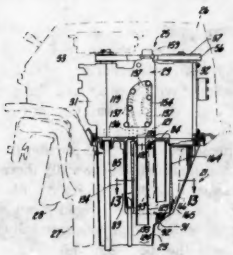
Tomonori Suzuki, Hamamatsu, and Makoto Toyohara, Shizuoka, both of Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha and Sanshin Kogyo Kabushiki Kaisha, both of, Japan

Filed Sep. 2, 1982, Ser. No. 414,040

Claims priority, application Japan, Sep. 10, 1981, 56-142659; Sep. 10, 1981, 56-142660; Sep. 10, 1981, 56-142661; Sep. 10, 1981, 56-142662

Int. Cl.[4] B63H *21/10*

U.S. Cl. 440—88 **17 Claims**



1. A cast cylinder block construction for a water-cooled internal combustion engine defining an integral cylinder bore, an integral water jacket surrounding said cylinder bore, an integral exhaust passage formed in said cylinder block and having an inlet formed in said cylinder block, an outlet formed in said cylinder block and an opening extending through a side wall of said cylinder block between said inlet and said outlet, a jacket plate having a projection formed therein extending at least in part into said exhaust passage and enclosing said opening, a cover plate affixed to said jacket plate and forming with said projection an exhaust cooling jacket, and means for communicating coolant between said water jacket and said exhaust cooling jacket.

4,588,386

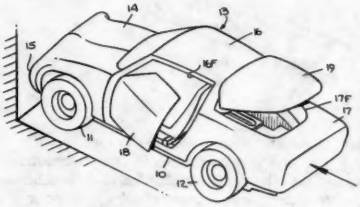
TOY CRASH VEHICLE

Melvin R. Kennedy, New York, N.Y.; Dietmar Nagel, Chester, N.J., and Abraham A. Arad, Westport, Conn., assignors to Buddy L Corporation, New York, N.Y.

Filed Mar. 4, 1985, Ser. No. 707,567

Int. Cl.[4] A63H *17/02*

U.S. Cl. 446—6 **8 Claims**



1. A motorized toy vehicle adapted upon frontal impact with a wall or other obstruction to simulate a crash and its effects, said vehicle comprising:

A. a chassis on which is supported the front and rear wheel axles;

B. a motor mounted on said chassis and coupled to one of said axles to propel said vehicle in the forward direction;

C. a hollow body mounted on said chassis over the motor, said body having a front hood section provided with a bumper prow, an intermediate cockpit section provided with a side door frame, and a rear trunk section, said intermediate and rear sections being formed of rigid material and being attached to said chassis, said front section being formed of resilient material and being free of said chassis;

D. a sled slidable along said chassis, the front end of said sled being attached to said prow, said sled being biased by a spring which urges said sled to a retracted position in which the front section of the body is then deformed to assume a crushed appearance, said sled being advanceable against the action of the spring to an extended position in which the front section is undeformed to assume a normal appearance, the sled being held in the extended position by a releasable spring-biased detent;

E. a hinged door mounted on said vehicle swingable from an open state to a closed state in which it lies within the door frame; and

F. means operatively coupling the door to the sled whereby when the door is manually swung from its open to its closed state, this action causes the sled to slide from its retracted to its detented extended position, the detent being released by the shock of said impact, thereby freeing the sled which, as it slides toward its retracted position, swings open the door to cause it to assume an outflung state.

4,588,387

ILLUMINATED INFANT TOY

Paula S. Swenson, Lakewood, Colo., assignor to Neptune Corporation, Lakewood, Colo.

Filed Feb. 27, 1984, Ser. No. 583,633

Int. Cl.[4] A63H *33/26, 5/00*

U.S. Cl. 446—130 **15 Claims**

1. A hand operated toy which provides both a sound and illuminated response to the user, said toy comprising;

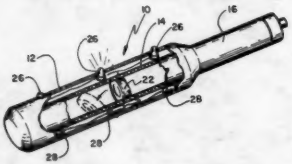
a housing having a tube which has opposite closed ends;

noise-producing means selectively movable back and forth within said tube from one said end to the other creating a sound upon impact with each said end;

a plurality of normally-open electrical switches spaced along said tube between said ends which is closed momentarily

and sequentially by said noise-producing means each time it moves through said tube from said one end thereof to the other;

battery means mounted in said housing; and



light means in said housing connected in circuit with said battery means and said switches which is intermittently and sequentially illuminated each time said switches are closed momentarily and sequentially by said noise-producing means moving along said tube.

4,588,388

SHAFT COUPLING

Ilie Chivari, Berliner Str. 1, 4690 Herne 2, Fed. Rep. of Germany

PCT No. PCT/DE81/00037, § 371 Date Oct. 21, 1981, § 102(e) Date Oct. 21, 1981, PCT Pub. No. WO81/02452, PCT Pub. Date Sep. 3, 1981

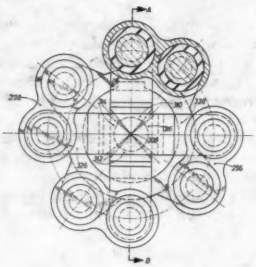
Continuation of Ser. No. 314,832, Oct. 21, 1981, abandoned.

This PCT application Feb. 25, 1981, Ser. No. 629,750

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1980, 3007348

Int. Cl.[4] F16D *3/62*

U.S. Cl. 464—69 **41 Claims**



1. A shaft coupling comprising:

a first coupling half;

a second coupling half; and

means for transmitting constant velocity between said first and second coupling halves, said means including;

an intermediary member disposed between said first and second coupling halves having a first side facing said first coupling half and a second side facing said second coupling half, said first and second coupling halves and said intermediary member defining an axial direction and a circumferential direction;

a first rigid guide member and a second rigid guide member interconnecting said first coupling half and said intermediary member at said first side of said intermediary member; and

a third rigid guide member and a fourth rigid guide member interconnecting said second coupling half and said intermediary member at said second side of said intermediary member;

in the neutral position of said coupling, said first and third rigid guide members being disposed in a first plane parallel to said axial direction and said second and fourth rigid guide members being disposed in a second plane parallel to said axial direction;

each said first, second, third, and fourth rigid guide member being articulated to a related one of said first coupling half and said second coupling half and to said intermediary member;

said second and said fourth rigid guide members being articulated at diametrically opposed locations with respect to said first and said third rigid guide members, respectively, at said intermediary member and at the related one of said first coupling half and said second coupling half; and

all of said first, second, third, and fourth rigid guide members extending from said intermediary member in said circumferential direction.

4,588,389

PULLEY DEVICE

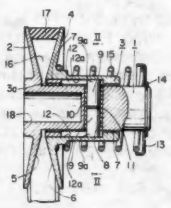
Yoshitaka Sakai, Nagoya, Japan, assignor to Sakai Manufacturing Co., Ltd., Nagoya, Japan

Filed Apr. 2, 1984, Ser. No. 595,944

Claims priority, application Japan, Aug. 30, 1983, 58-158383

Int. Cl.[4] F16H *55/56*

U.S. Cl. 474—43 **14 Claims**



1. A pulley device comprising:

a shaft provided at one end portion thereof with a first disk extending radially outwardly therefrom, one surface of said disk being inclined with respect to a plane perpendicular to an axis of said shaft said shaft also provided with a radial through bore;

a tubular member provided at one end portion thereof with a second disk extending radially outwardly therefrom, one surface of said second disk being inclined with respect to a plane perpendicular to an axis of said tubular member; said tubular member slidably and concentrically enclosing said shaft so as to define between said first and second disks an annular groove for a driving belt, the axial width of said annular groove being progressively increased along a radial direction thereof, said tubular member having at least one axial groove provided on an inner peripheral wall thereof;

means for urging said tubular member toward said first disk;

roll pin means diametrically extending within said shaft and engaging with both of said shaft and said tubular member by having been inserted into said bore, at least one end of said pin roll means being received in said at least one axial groove; and

bearing means for bearing at least one portion of said roll pin means, said bearing means being disposed between said roll pin means and said bore to permit rotational movement of said roll pin means.

4,588,390

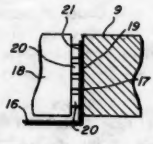
MEANS AND METHOD FOR PRODUCTION OF BOX BLANKS, BOXES FORMED THEREFROM AND APPARATUS USEFUL THEREWITH

Jurgen Heitele, Stuttgart, and Rudolf Kemmler, Backnang, both of Fed. Rep. of Germany, assignors to Rotopack GmbH, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 498,716, May 27, 1983. This application Jun. 1, 1983, Ser. No. 499,824

Int. Cl. B31B *1/64*

U.S. Cl. 493—133 **11 Claims**



1. Method for forming cartons from sheet material blanks having sealing portions, said method comprising,

coating said blanks at sealing portions thereof with a varnish comprishing thermoplastic solids in a liquid vehicle said solids being present in sufficient amount to form a thermoplastic seal,

joining said sealing portions and positioning between a sonotrode face and back up anvil sealing surface carrying a plurality of spaced projections,

compressing a sealing area of overlapped sealing portions with said projections biting into said portions to effectively deliver ultrasonic energy near to a seal line reducing the distance between said anvil sealing surface and sonotrode to increase the effect of ultrasonic energy used to form a seal

and heat sealing said portions using said sonotrode to seal said portions.

4,588,391

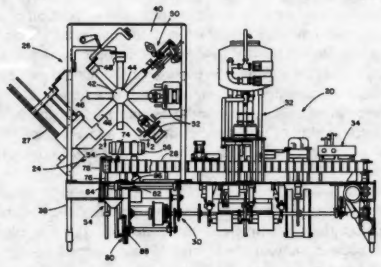
TRANSFER SYSTEM FOR USE IN CARTON FORMING AND FILLING MACHINERY

James W. Evans; John P. Scheid, and Daniel R. Eichinger, all of Cedar Rapids, Iowa, assignors to Cherry-Burrell Corporation, Cedar Rapids, Iowa

Filed Oct. 17, 1984, Ser. No. 661,585

Int. Cl.⁴ F16H *7/20*

U.S. Cl. 493—165 **8 Claims**



7. A transfer system for use in machinery having stations for forming, filling and sealing cartons including a turret having a plurality of mandrels receiving carton blanks, for use in forming said cartons, and a main conveyor for conveying formed cartons to filling and sealing stations of said machinery; said transfer system comprising:

a transfer conveyor movable in the same direction as said main conveyor and disposed below said turret and above said main conveyor and aligned with both said turret and said main conveyor receiving formed cartons from said turret and holding cartons in alignment with said main conveyor;

means stripping cartons from said mandrels and delivering said stripped cartons to said transfer conveyor and moving cartons from said transfer conveyor to said main conveyor; and

means controlling said first-mentioned means to simultaneously move one carton to said transfer conveyor and two cartons to said main conveyor during each dwell period of said main conveyor.

4,588,392

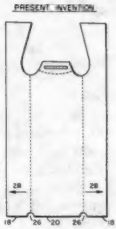
METHOD OF FORMING A THERMOPLASTIC FILM SACK HAVING A STRESS RELIEVED BOTTOM GUSSET SEAL LINE

Robert T. Maddock, W. Rush, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 584,836, Feb. 29, 1984. This application Apr. 22, 1985, Ser. No. 725,975

Int. Cl.⁴ B31B *1/64*

U.S. Cl. 493—200 **3 Claims**



1. In a process for forming a thermoplastic film sack comprising:

(a) forming two oppositely disposed gussets in a thermoplastic tube,

(b) collapsing said tube,

(c) sealing one end of said tube transverse to said gussets, and

(d) removing an end region of the sealed end of said tube so as to form an open mouth portion and integral handles;

the improvement comprising, a bottom seal transverse to said gussets, removing the film area below a curve extending from a point at the bottom of the four film layers of each gusset region to a point at the bottom of the two film layers of said sack so as to provide a plurality relief regions therein.

4,588,393

APPARATUS AND METHOD FOR FOLDING CUT SHEET PAPER

John Cogswell, Needham, and Robert F. Fokos, Wayland, both of Mass., assignors to Sun Chemical Corporation, New York, N.Y.

Filed May 24, 1983, Ser. No. 497,642

Int. Cl.⁴ B31B *1/58*

U.S. Cl. 493—440 **25 Claims**

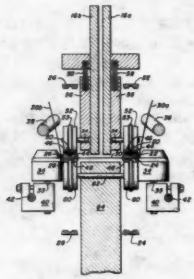
1. Apparatus for forming at least one fold in a non-creased sheet-like product, particularly one formed of paper, moving in a first direction, comprising:

at least one pair of opposed belts that positively and continuously grips said product as it traverses said apparatus, with at least one portion of each of said product projecting from one edge of at least one of said gripping belts, said one edge extending in said first direction and providing a reference edge that defines the location of said fold, and said at least one belt having a substantially flat surface that

engages said product and a side surface that slopes away from said one edge at an acute angle with respect to a plane perpendicular to said substantially flat belt surface,

means for advancing said belts in a manner that carries said gripped product through said apparatus with substantially no relative motion between said belts and said product,

means associated with said one edge for rotating said projecting portion of said product through a predetermined angular rotation about and into engagement with said one edge, said rotating means having product engaging means that is inclined with respect to said projecting portion with an angle of inclination that increases incrementally along said first direction, whereby the movement of the



product carried by said belts drives said projecting portion of said product onto said engaging means to produce a fold in said product at said one edge, said engaging means being movable with respect to said product advancing through said apparatus so that there is also substantially no relative movement between said engaging means and said product, and

a plurality of idler wheels that urge said belts toward one another to grip said product positively as it traverses the folding apparatus along said first direction,

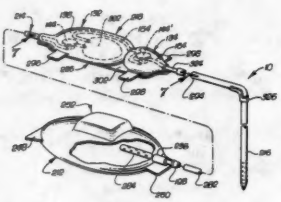
said belts each having a continuous longitudinal groove formed in its face opposite said product, said groove having a configuration and dimensions selected to receive said idler wheels in a close-fitting relationship.

4,588,394

INFUSION RESERVOIR AND PUMP SYSTEM

Rudolf R. Schulte, Santa Barbara; Gary P. East, and Alfons Heindle, both of Goleta, all of Calif., assignors to Pudenz-Schulte Medical Research Corp., Santa Barbara, Calif.

Filed Mar. 16, 1984, Ser. No. 590,349
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—9 **110 Claims**



1. A normally closed valve for use in an infusion reservoir and pump system, said valve comprising:

a resiliently flexible housing having an inlet and an outlet;

an inlet chamber within said housing, said inlet chamber being in open communication with said inlet;

an outlet chamber within said housing, said outlet chamber generally overlying said inlet chamber and said outlet chamber being in open communication with said outlet;

a valve passageway through said housing between said inlet chamber and said outlet chamber, the portion of said housing generally surrounding said valve passageway forming a valve seat; and

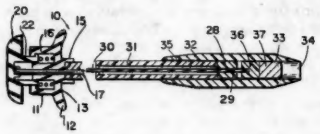
a valve stem attached to and extending downwardly from an upper ceiling of said outlet chamber through said valve passageway and into said inlet chamber, said valve stem including a lower foot which sealingly engages said valve seat, the seal being replaceably broken when a housing cover overlying said outlet chamber is resiliently deformed to cause the downward movement of said valve stem through said valve passageway.

4,588,395

CATHETER AND METHOD

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Continuation-in-part of Ser. No. 885,263, Mar. 10, 1978, abandoned. This application Oct. 28, 1980, Ser. No. 201,531
Int. Cl.[4] A61M *25/00*
U.S. Cl. 604—59 **5 Claims**



1. A catheter or the like comprising in combination:

an elongated flexible tube adapted to be inserted into and moved along a body duct such as an artery,

an operating head attached to and terminating one end of said flexible tube,

said operating head being formed of a flexible material and having a flexible front end portion which normally tapers from a first constant diameter portion to a smaller diameter at the front end of said head,

said tapering portion of said head being tubular in configuration, a front end portion of said head being made of said flexible material and having opposite portions of the tubular wall thereof normally collapsed into abutment with each other so as to form a flattened tubular formation having a closed passageway therebetween at the front end of said tapering portion of said head, which closed passageway is an extension of the open tubular portion of said head and wherein the collapsed tubular wall thereof is expandable outwardly in a manner to open said passageway and form a tubular extension of the diameter portion of said head which extension is open at its end,

the portion of said head located behind said normally collapsed portion of said head containing a quantity of material adapted to be dispensed from the end of said operating head,

means extending through said head for urging movement of the material located within said head behind the collapsed portion thereby through said head and the flat closed passageway thereof at the end of said tapered portion of said head in a manner to expand the collapsed portion of said head so as to outwardly deform the opposite portions of the end of said head and to provide an open passageway therethrough to permit at least a portion of said material to pass completely through said head and to be expelled therefrom to the exterior of said head, and

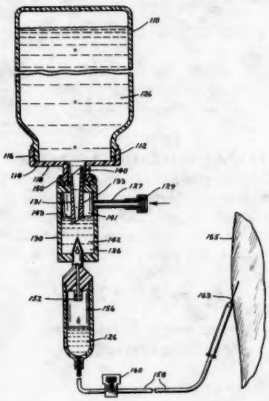
means at the other end of said elongated flexible tube for controlling the operation of said means for urging movement of said material through said head to permit said material to be dispensed beyond said head.

4,588,396

APPARATUS FOR GRAVITY FEED OF LIQUID UNDER CONSTANT HYDROSTATIC PRESSURE

Maurice G. Stroebel, and Terryl T. Stroebel, both of Rte. 1, Danvers, Minn. 56231

Continuation-in-part of Ser. No. 436,007, Oct. 22, 1982, abandoned. This application Aug. 31, 1983, Ser. No. 528,048
Int. Cl.[4] A61M *5/00*
U.S. Cl. 604—246 **8 Claims**



1. In combination with an invertable and inverted liquid tight liquid supply bottle having a penetrable cover, an apparatus for gravity feed of liquid under constant hydrostatic pressure, such apparatus including:

a. a reservoir defining a basin at one end thereof and having a receiving end on the opposite end thereof;

b. means for introducing atmospheric pressure into said reservoir above said basin end;

c. a liquid supply conduit connected to said receiving end having a tapered supply passage therethrough having an end for penetrating said cover and a delivery end, said tapered passge having its larger diameter end adjacent said penetrating end and its smaller diameter end arranged in spaced relation above said basin end and below said pressure introduction means; and

d. a fluid flow passge means arranged in said basin end for delivery of fluid therefrom.

4,588,397

EXTERNAL CATHETER FOR INCONTINENT MALES

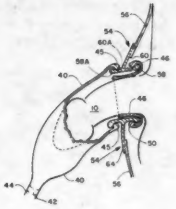
Joseph J. Giacalone, 2547 La Serena, Escondido, Calif. 92025

Continuation-in-part of Ser. No. 559,344, Dec. 8, 1983. This application May 31, 1985, Ser. No. 739,696
Int. Cl.[4] A61F *5/44*
U.S. Cl. 604—349 **7 Claims**

1. An external urine catheter system for incontinent males which comprises:

a nether garment means adapted to engage and surround the lower trunk of a user, said nether garment means having an aperture therein;

a ring-like annular collar means for insertion into said aperture, said ring-like collar means having inner and outer lip means with an annular flange means positioned between said lip means, said inner lip means oriented toward the body of a user, intermediate between each said lip means and said annular flange means is a channel base means forming inner and outer channel base means, said annular flange means is fixedly secured to said nether garment, a longitudinal centrally disposed axial bore means extends completely through said collar means for the insertion of a user's penis and an internal seal means, said internal seal means includes a hollow frusto-conical elastic membrane having a base at a larger inner end of said seal means and an outer edge portion means, said base having a first reinforcing ring means for overlapping the inner lip means of said collar means and into said inner channel base means, said outer edge portion means for engaging the user's penis in a sealing manner;



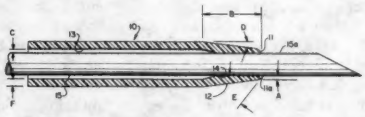
a flexible tubular sheath having at one end a connecting means and a drain tube and a reinforcing ring means at opposite end for overlapping said outer lip portion of said collar means and removably engaging said outer channel base means, said sheath having an intermediate section to enclose a user's penis.

4,588,398

CATHETER TIP CONFIGURATION

Charles W. Daugherty, Xenia, Ohio; Mohammad A. Khan, Sandy, Utah; David J. Lentz, Salt Lake City, Utah, and Stephen L. Thoresen, Orem, Utah, assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Sep. 12, 1984, Ser. No. 649,568
Int. Cl.[4] A61M *5/00, 25/00*
U.S. Cl. 604—265 **6 Claims**



1. A polymeric catheter for over the needle insertion into a puncture site in the human body comprising:

an elongated hollow tubular polymeric catheter body molded of polyurethane resin having an ultimate tensile of 7,500 to 10,500 psi depending upon gauge and being treated with surface lubrication,

a tapered end portion on said body having a first tapering portion with a relatively slight angle of between 3 degrees 30 minutes and 4 degrees 30 minutes, with respect to the axis of said body and terminating with a strong and completely circumferential chamfered lead portion at the penetrating tip to resist catheter tip damage and aid penetration at the puncture site where said lead portion extends outwardly from said first tapering portion to the distal tip of said catheter which first engages the puncture and said chamfered lead portion having a relatively blunt angle of between 25 and 35 degrees with respect to the axis of the catheter.

4,588,399

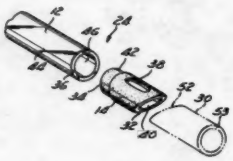
CANNULA WITH RADIOPAQUE TIP

Perry A. Nebergall, Laguna Hills, and Robert C. French, El Toro, both of Calif., assignors to Shiley Incorporated, Irvine, Calif.

Continuation of Ser. No. 462,907, Feb. 2, 1983, abandoned, which is a continuation of Ser. No. 149,568, May 14, 1980, Pat. No. 4,419,095. This application Apr. 3, 1984, Ser. No. 596,069 The portion of the term of this patent subsequent to Dec. 6, 2000, has been disclaimed.

Int. Cl.[4] A61M *25/00*

U.S. Cl. 604—280 **9 Claims**



1. A composite cannula adapted for use with an inflatable cuff, said cuff having distal and proximal sleeves for attachment to said cannula, comprising:

a parent cannula member;

radiopaque tip means substantially softer than said parent cannula member, said tip means being constructed apart from said parent cannula member and integrally attached to the distal end of said parent cannula member by radio frequency dielectric heating so that the respective mating ends of said parent cannula member and said radiopaque tip form substantially continuous smooth external and internal wall surfaces on said composite cannula to prevent the accumulation of mucus and other bodily secretions within said cannula and to prevent injury to said patient when said composite cannula is inserted into a body cavity, duct, vessel, and the like, of said patient;

said respective mating ends of said parent cannula member and said radiopaque top abutting one another to form a joint without overlap, the outer diameter of said parent cannula member being substantially the same as the outer diameter of said tip at said joint, the outer diameter of said tip at a location distal of said joint being less than the outer diameter of said parent cannula member to form a reduced diameter portion on said tip, said reduced diameter portion distally terminating in a shoulder, said inflatable cuff being mounted on said cannula by means of said distal sleeve which engages said reduced diameter portion, the distal edge of said distal sleeve abutting said shoulder on said reduced diameter portion, thereby maintaining the continuous smooth external wall surface of said composite cannula; and

a drainage opening formed in said radiopaque tip, said opening having a diameter substantially the same as the inner diameter of said parent cannula member to maintain the substantially continuous smooth internal wall surfaces of said composite cannula.

4,588,400

LIQUID LOADED PAD FOR MEDICAL APPLICATIONS

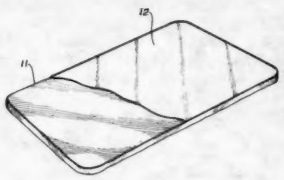
David F. Ring, Skillman; Wilson Nashed, North Brunswick, and Thurman Dow, Somerville, all of N.J., assignors to Johnson & Johnson Products, Inc., New Brunswick, N.J.

Filed Dec. 16, 1982, Ser. No. 450,324

Int. Cl.[4] A61F *13/00*

U.S. Cl. 604—304 **26 Claims**

1. A liquid loaded pad for medical applications comprising a fibrous mass of microbially-produced cellulose fibrils and a sterile, physiologically-acceptable liquid retained within the



interstices of said fibrous mass, said fibrous mass having a coherent and dimensionally stable structure.

4,588,401

PLATELET STORAGE CONTAINER

Henn Kilkson, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 392,295, Jun. 29, 1982, Pat. No. 4,496,361, which is a continuation-in-part of Ser. No. 290,328, Aug. 5, 1981, abandoned. This application Jun. 6, 1984, Ser. No. 617,707

Int. Cl.[4] A61M *5/00*

U.S. Cl. 604—408 **13 Claims**

1. A platelet storage container made from a copolymeric film material capable of being heat sealed at a low temperature and having

an oxygen permeability of at least about 1.8×10^5 μm^3 (STP)/(m^2·sec·Pa),

a carbon dioxide permeability of from about 4.4×10^5 to about 8.0×10^5 μm^3 (STP)/(m^2·sec·Pa),

a tensile strength of at least about 8 mPa,

a seal strength of at least about 1000 g/cm,

a stiffness low enough that the container can be extended by liquid to a capacity of about 275 ml,

a durability sufficient to provide a dart drop value of at least about 100, and

a thickness of from about 0.08 to about 0.23 mm.

4,588,402

CONNECTOR FOR MEDICAL TUBING AND MEDICAL SOLUTION BAG DEVICE USING THE CONNECTOR

Akira Igari, Tokyo, and Keinosuke Isono, Kawaguchi, both of Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 425,883, Sep. 28, 1982, abandoned. This application May 1, 1985, Ser. No. 729,080

Claims priority, application Japan, Mar. 9, 1982, 57-35722; Mar. 24, 1982, 57-45673

Int. Cl.[4] A61B *19/00*; A61M *25/00*

U.S. Cl. 604—408 **35 Claims**

1. A connector arrangement for medical tubing for liquid transfusion, the connector connecting together two flexible tubes, the connector arrangement comprising:

a tubular male connector member made of thermally resistant corrosionproof material, and having an end adapted to be connected by insertion to the connecting end of one of said two flexible tubes, said male connector member having a male engaging portion having a male insertion end shaped in a male form at the end thereof opposite from the aforementioned end connected to a tube, and further having an inner passage extending therethrough;

a tubular female connector member made of thermally resistant corrosionproof material, and having an end adapted to be connected by insertion to the connecting end of the other of said two flexible tubes, said female connector member having a female engaging portion having a female insertion end shaped in a female form which is dimensioned for fast insertion into the insertion end shaped in the male form of said male connector member at the end

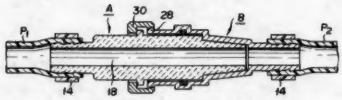
opposite from said other of said two tubes and further having an inner passage extending therethrough;

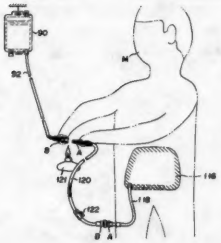
a first fitting surface portion provided on said male connector member on the outer surface of said male insertion end thereof; and

a second fitting surface portion provided on an inner surface portion of said female insertion end of said female connector member;

said first fitting surface portion of said male connector member being made of a material having a smaller thermal expansion coefficient than the material of said second fitting surface portion of said female connector member, and said first fitting surface portion of said male connector member and said second fitting surface portion of said female connector member having relative sizes such as to permit the insertion ends thereof to be connected to and separated from each other by shrink fit utilizing a difference between the thermal expansion coefficients thereof;

wherein the materials forming said male and said female connector members including said first and said second fitting surface portions are capable of withstanding heating to a temperature sufficient for sterilization of both connector members, and said difference between the thermal expansion coefficients is selected to enable both connector members to be joined to and separated from one another at the sterilization temperature.





26. A method for coupling and separating a connector arrangement for medical tubing for liquid transfusion under a sterilized state, using a connector for connecting together two flexible tubes, the method comprising:

coupling together a tubular male connector member and a tubular female connector member by heating them with a flame to sterilize said male and female connector members, inserting said male connector members into said female connector member, and allowing said male and female connectors to cool to shrink fit to each other to be strongly connected together; and then

separating said coupled together male and female connector members by heating them with a flame to sterilize connector members, and then applying a separating force to said male and female connector members until they separate from each other;

the tubular male connector member being made of thermally resistant corrosionproof material, and having an end adapted to be connected by insertion to the connecting end of one of said two flexible tubes, said male connector member having a male engaging portion having a male insertion end shaped in a male form at the end thereof opposite from the aforementioned end connected to a tube, and further having an inner pasaage extending therethrough;

the tubular female connector member being made of thermally resistant corrosionproof material, and having an end adapted to be connected by insertion to the connecting end of the other of said two flexible tubes, said female connector member having a female engaging portion having a female insertion end shaped in a female form which is dimensioned for fast insertion into the insertion end shaped in the male form of said male connector member at the end opposite from said other of said two tubes and further having an inner passage extending therethrough;

a first fitting surface portion provided on said male connector member on the outer surface of said male insertion end thereof; and

a second fitting surface portion provided on an inner surface portion of said female insertion end of said female connector member;

said first fitting surface portion of said male connector member being made of a material having a smaller thermal expansion coefficient than the material of said second fitting surface portion of said female connector member, and said first fitting surface portion of said male connector member and said second fitting surface portion of said female connector member having relative sizes such as to permit the insertion ends thereof to be connected to and separated from each other by shrink fit utilizing a difference between the thermal expansion coefficients thereof;

wherein the materials forming said male and said female connector members including said first and said second fitting surface portions are capable of withstanding heating to a temperature sufficient for sterilization of both connector member, and said dfference between the thermal expansion coefficients is selected to enable both connector members to be joined to and separated from one another at the sterilization temperature.

4,588,403

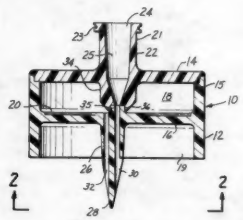
VENTED SYRINGE ADAPTER ASSEMBLY

Merkel F. Weiss, Granada Hills; Joel C. Parrott, Valencia, and Lisa Martel, Pasadena, all of Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Jun. 1, 1984, Ser. No. 616,330

Int. Cl.[4] A61B *19/00*

U.S. Cl. 604—411 **4 Claims**



1. A vented syringe adapter assembly comprising:

a first housing portion comprising a single lumen tubular conduit and a generally circular planar surface extending outwardly from and between the ends of the single lumen tubular conduit such that the lumen extends centrally through the first housing portion, the single lumen tubular conduit including syringe connector means on a first end and a recess on its second end through which the centrally extending lumen opens;

a second sidewall housing portion comprising a generally cylindrical sidewall, a planar surface having provided openings therethrough, which planar surface extends across and joins the cylindrical sidewall, and a dual lumen

tubular conduit extending through the planar surface generally parallel to the cylindrical sidewall with one of the lumens extending centrally through the second housing portion, wherein a first end of the dual lumen tubular conduit extends to define a piercing tip with both lumens opening therealong and second end which includes an opening for the centrally extending lumen and which second end extends to coincide with the recess on the second end of the single lumen tubular conduit, the second lumen of the dual lumen tubular conduit opens on the planar surface of such second housing portion, the second housing portion further comprising a circular recess on the planar surface, the first housing portion and second housing portions being interconnectable such that the circular planar surface of the first housing portion interconnects to the cylindrical sidewall of the second housing portion to form a chamber defined by the planar surface of the first housing portion and cylindrical surface and planar surface of the second housing portion and such that the second end of the dual lumen tubular conduit interconnects with the recess on the second end of the single lumen tubular conduit to provide one lumen extending through the combined first and second housing portions and one lumen opening into the chamber; and

a generally circular hydrophobic filter provided in the recess on the circular planar surface of the second portion, which hydrophobic filter extends over the provided openings.

4,588,404

TOTAL CARDIAC PROSTHESIS

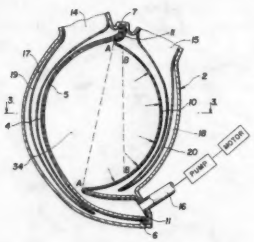
Didier Lapeyre, Chaignes, 27120 Pacy Sur Eure, France

Continuation-in-part of Ser. No. 113,778, Jan. 21, 1980, abandoned. This application Mar. 18, 1982, Ser. No. 359,524

Claims priority, application France, Jan. 22, 1979, 79 01529; Nov. 29, 1979, 79 29365

Int. Cl.[4] A61F *2/22*

U.S. Cl. 623—3 **26 Claims**



1. A total heart prosthesis comprising a case implantable in the pericardial cavity and constructed from a material biocompatible with respect to the surrounding tissues, aperture means for power fluid, and inlet and outlet blood valvular orifices opening into said case;

a curved internal rigid support having a generally convex face and a generally concave face and dividing said case into a right ventricle chamber and a left ventricle chamber having substantially the same volume but different configurations, said right ventricle chamber being adjacent said convex face of said rigid support;

a first blood bladder positioned freely within said right chamber with its lip sealed to one of said inlet and one of said outlet orifices;

a second blood bladder position freely within said left chamber with its lip sealed to another one of said inlet and another one of said outlet orifices;

first and second elastomeric membranes within said case, said first membrane being adapted to rest against said convex face of said rigid support, and said second membrane being capable of resting against said concave face of said rigid support;

a fluid energy source adapted to be connected to said aperture means for conducting said pressurized fluid flow onto said membranes for deforming said first membrane through elongation thereof and thereby varying the volume of said right chamber, and for displacing said second membrane to vary the volume of said second chamber, both said chambers thus forming a biventricular one-piece unit;

valves mounted in said valvular orifices for anastomosis with the blood vessels of the circulatory network of a bearer, which valves have a diameter compatible with the auriculo-ventricular natural aortic and pulmonary ejection characteristics of the blood vessels and with the physiological kinetic pressures of the blood circulating in the prosthesis from the left ventricle into the aorta and from the right ventricle into the pulmonary so as to minimize pressure drop phenomena and any transvalvular pressure gradient; and

means for activating said fluid energy source, and means for regulating the cardiac flow with respect to the filling pressure of the left ventricle chamber and to the aortic pressure.

4,588,405

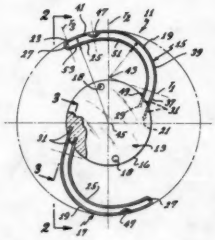
INTRAOCULAR LENS ASSEMBLY

Guy E. Knolle, Jr., Houston, Tex., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed Jun. 10, 1983, Ser. No. 503,278

Int. Cl.[4] A61F *2/16*

U.S. Cl. 623—6 **16 Claims**



13. An intraocular lens assembly for implantation in the eye comprising:

a lens;

first and second support members coupled to said lens and extending to locations spaced radially outwardly of the lens;

at least one of said support members comprising a resiliently deformable strand having an outer segment which extends from the lens to a distal location spaced radially outwardly of the lens and an inner segment joined to the outer segment adjacent said distal location and extending to the lens;

regions of said inner segment being generally between the outer segment and the lens; and

at least major portions of the outer and inner segments being geometrically similar and each of said segments including a straight section extending from the lens, a proximal curve joined to the straight section, and a distal curve with the proximal curve being sharper than the distal curve and with said curves being concave toward the lens whereby said one support member can be resiliently deformed to bring said distal location toward the lens.

4,588,406

INTRAOCULAR LENS

Svyatoslav N. Fedorov, ulitsa Dostoevskogo, 12, kv. 32.; Eleonora V. Egorova, ulitsa Kuusinena, 15, kv. 41.; Oleg P. Spiridonov, shosse Entuziastov, 100, korpus 5, kv. 108.; Sergei R. Nanushian, ulitsa Stalevarov, 4, korpus 1, kv. 13.; Igor L. Benenson, Karetny ryad, 5/10, kv. 138.; Evgeny I. Degtev, Yaroslavskoe shosse, 14, kv. 34.; Vyacheslav N. Masterov, ulitsa Dubninskaya, 16, korpus 5, kv. 268., and Vladimir G. Kiselev, ulitsa Musorgskogo, 1, kv. 30.; Vadim Vladimirovich Severny, ulitsa Veshnyakovskogo, 2 kv. 178, all of Moscow, U.S.S.R.

Filed Aug. 15, 1985, Ser. No. 766,651

Int. Cl.[4] A61F *2/16*

U.S. Cl. 623—6 3 Claims

1. In an intraocular lens comprising an optical part and a support part, an improvement consisting in that the support part is made of a cellular material having substantially closed gas-filled voids in numbers ensuring buoyancy of the lens.

4,588,407

ARTIFICIAL ORGAN AND METHOD FOR MANUFACTURE THEREOF

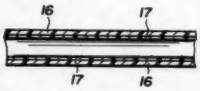
Keinosuke Isono, Kawaguchi, and Keiji Naoi, Tokyo, both of Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 7, 1983, Ser. No. 530,023

Claims priority, application Japan, Sep. 9, 1982, 57-155842; Oct. 6, 1982, 57-174478; Oct. 6, 1982, 57-174479; Oct. 6, 1982, 57-174480

Int. Cl.[4] A61F *2/02;* B01D *13/00*

U.S. Cl. 623—11 16 Claims



1. An artificial organ having a zone for flow of a body fluid within said artificial organ; and a film of a fat-soluble vitamin deposited on surfaces of parts of said artificial organ adapted to contact with said body fluid in motion through said zone.

4,588,408

TREATED HAIR FOR IMPLANTATION

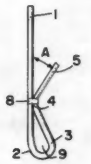
Shiro Yamada, No. 31-8, Koboyama, Kobo-cho, Chiryu-shi, Aichi-ken, Japan

Continuation-in-part of Ser. No. 132,176, Mar. 20, 1980, abandoned. This application Sep. 15, 1982, Ser. No. 418,454

Claims priority, application Japan, Mar. 29, 1979, 54-40005; Mar. 29, 1979, 54-40006; Canada, Mar. 25, 1980, 3481399; Fed. Rep. of Germany, Mar. 25, 1980, 3011520; United Kingdom, Mar. 27, 1980, 8010401; France, Mar. 31, 1980, 8007222

Int. Cl.[4] A61F *1/00*

U.S. Cl. 623—15 8 Claims



1. A hair for implantation comprising: an extended body portion and a relatively short unknotted root portion adapted to be implanted beneath the surface of the human skin, said root portion comprising:

a strand forming a generally water-droplet shaped open loop, said strand crossing itself and being adhered to itself by high frequency point welding at the crossing point, which crossing point is located at the top of said loop, and a free end hook portion projected upwardly from said crossing point at a acute angle, said strand having sufficient rigidity to maintain said acute angle.

4,588,409

COLOR-CHANGING DYED PRODUCT AND PROCESS

Owen H. Sercus, 125 W. 12th St., New York, N.Y. 10011

Filed Dec. 22, 1983, Ser. No. 564,325

Int. Cl.⁴ D06P *5/13, 5/02, 5/00*

U.S. Cl. 8—403 9 Claims

1. A colored textile product capable of changing color upon treatment with bleach, comprising a woven, non-woven, or knitted cellulosic fabric, uniformly dyed throughout its cross-section in every plane perpendicular to the fabric surface with at least two dyes of different colors, one of said dyes being a reactive dye or a vat dye stable to bleach and the other being a reactive dye which is subject to decolorization by bleach.

3. A method of providing a colored textile product capable of having its color changed by treatment with bleach, which consists essentially of dyeing a woven, non-woven, or knitted cellulosic fabric throughout its cross-section in every plane perpendicular to the fabric surface, with two dyes, one of which is a reactive dye or a vat dye which is stable to household bleach, and the other of which, having a different color from the first dye, is a reactive dye subject to decolorization by bleach.

4,588,410

NOVEL 2-HYDROXY-4-AMINOBENZENES, METHOD FOR THEIR MANUFACTURING AND HAIR COLORING AGENTS CONTAINING THESE COMPOUNDS

Eugen Konrad, Darmstadt, Fed. Rep. of Germany; Hans-Jürgen Braun, Marly, and Herbert Mager, Fribourg, both of Switzerland, assignors to Wella Aktiengesellschaft, Darmstadt, Fed. Rep. of Germany

PCT No. PCT/EP82/00245, § 371 Date Jul. 18, 1983, § 102(e) Date Jul. 18, 1983, PCT Pub. No. WO83/01771, PCT Pub. Date May 26, 1983

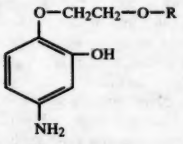
PCT Filed Nov. 15, 1982, Ser. No. 517,524

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1981, 3145811

Int. Cl.⁴ A61K *7/13;* C07L *91/40*

U.S. Cl. 8—421 19 Claims

1. 2-hydroxy-4-aminobenzenes of the general formula



(I)

wherein R is a hydrogen, a methyl group or a hydroxy ethyl group.

4,588,411

LONG-SHELFLIFE PRINT CONTAINING REACTIVE DYE AND ALKALI ACETATE PASTES AND THEIR USE

Peter Scheibli, Bottmingen; Alex Känzig, Therwil, and Andres Schaub, Biel-Benken, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 6, 1984, Ser. No. 679,010

Claims priority, application Switzerland, Dec. 8, 1983, 6571/83

Int. Cl.⁴ C09B *67/00, 67/24;* D06P *3/66*

U.S. Cl. 8—528 16 Claims

1. A long-shelflife alkaline urea free print paste consisting essentailly of at least one water-soluble reactive dye of the formula

$$D-(X)_m \quad (1),$$

in which D is the radical of an organic dye of the monoazo, polyazo, metal complex azo, anthraquinone, phthalocyanine, formazan, azomethine, nitroaryl, dioxazine, phenazine or stilbene series, X is a fibre-reactive radical of the aliphatic, aromatic or heterocyclic series which is bonded to the radical D either directly or via a bridge member, and m is 1, 2, 3, 4, 5 or 6, and, per fibre-reactive radical X, two times to six twice the stoichiometric amount of an alkali metal acetate.

4,588,412

SOLID FORMULATIONS OF DYES WHICH ARE SPARINGLY SOLUBLE OR INSOLUBLE IN WATER

Paul Hugelshofer, Muttenz, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 14, 1984, Ser. No. 681,990

Claims priority, application Switzerland, Dec. 21, 1983, 6796/83

Int. Cl.⁴ C09B *67/02*

U.S. Cl. 8—524 13 Claims

1. A solid formulation of a vat dye, which formulation contains a dialkyl sulfosuccinate having 3 to 8 carbon atoms in each alkyl moiety, and/or a branched or unbranched acetylene glycol containing 8 to 20 carbon atoms, in addition to the dye and one or more anionic dispersants, optionally together with further auxiliaries conventionally employed in powdered formulations.

4,588,413

PROCESS FOR PRODUCING DYEINGS WITH REACTIVE DYESTUFFS

Karl-Heinz Keil, Hanau-Mittelbuchen; Fritz Engelhardt, Frankfurt; Ulrich Greiner, Schöneck; Klaus Sternberger, Bad Vilbel, and Manfred Pelster, Speyer, all of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Jul. 19, 1984, Ser. No. 632,243

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1983, 3329029

Int. Cl.⁴ C09B *62/00*

U.S. Cl. 8—543 10 Claims

1. In the process for dyeing textile materials, yarns, threads or fibers dyeable with reactive dyestuffs by contact and treatment with reactive dyestuff,

the improvement comprises improving the fastness of the dyed substrate by aftertreating the dyed substrate with 0.5 to 5% by weight of substrate of an aftertreatment agent which is the reaction product of polyethyleneimine and an alkylating agent having two alkylating groups in an aqueous solution.

4,588,414

COUNTERCURRENT, COOLING CRYSTALLIZATION AND PURIFICATION METHOD FOR MULTI-COMPONENT MOLTEN MIXTURE

Keizo Takegami, Kanagawa; Minoru Morita, Tokyo; Kazuto Nakamaru, Chiba, and Koji Miwa, Kanagawa, all of Japan, assignors to Tsukishima Kikai Co., Ltd. and Mitsubishi Gas Chemical Company, Inc., both of Tokyo, Japan

Filed Sep. 23, 1983, Ser. No. 535,456

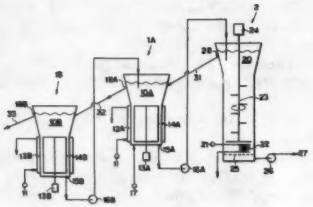
Claims priority, application Japan, Oct. 5, 1982, 57-175168

Int. Cl.⁴ B01D *9/02*

U.S. Cl. 23—295 R 8 Claims

1. In a countercurrent, cooling crystallization and purification method for a multi-component molten mixture for separating a component of the mixture, wherein the purification of the molten mixture is effected by countercurrent contact of crystals formed with a mother liquor, wherein the improvement comprises, in a system comprising a cooling type crystallizer having, at its upper portion, a clarifying portion containing a liquid and a vertical purifier having, at its upper portion, a clarifying portion and, at its lower portion, heating means, and the contents of said purifier are at a temperature higher than the contents of said crystallizer, feeding said molten mixture into the crystallizer, feeding crystals formed in the crystallizer to the clarifying portion of the purifier, allowing the crystals in

the clarifying portion of the purifier to move downwardly therein and melting said crystals by said heating means, withdrawing a portion of the resulting melt as a product and allowing the remainder of said melt to move upwardly in said purifier as a reflux to wash the descending crystals, and feeding the clarified liquid from the clarifying portion of the purifier directly to the liquid in the clarifying portion of the crystallizer in which the crystallization is carried out at a temperature lower than the operation temperature of the purifier so that crystals formed in the crystallizer are washed and the clarified liquid fed from the purifier is cooled by the liquid of a lower temperature in the crystallizer to be recrystallized.



4,588,415

FUEL COMPOSITIONS

Edward F. Zaweski, and Leonard M. Niebylski, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Sep. 20, 1985, Ser. No. 778,017

Int. Cl.[4] C10L *1/26*

U.S. Cl. 44—57 **25 Claims**

1. Distillate fuel for indirect injection compression ignition engines containing at least the combination of (i) organic nitrate ignition accelerator, and (ii) a dihydrocarbyl phosphite, said combination being present in an amount sufficient to minimize the coking characteristics of such fuel, especially throttling nozzle coking in the prechambers or swirl chambers of indirect injection compression ignition engines operated on such fuel.

4,588,416

FUEL COMPOSITIONS

Edward F. Zaweski, and Leonard M. Niebylski, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Sep. 20, 1985, Ser. No. 778,018

Int. Cl.[4] C10L *1/24*

U.S. Cl. 44—57 **17 Claims**

1. Distillate fuel for indirect injection compression ignition engines containing at least the combination of (i) organic nitrate ignition accelerator, and (ii) a basic sulfurized alkaline earth metal alkyl phenate, said combination being present in an amount sufficient to minimize the coking characteristics of such fuel, especially throttling nozzle coking in the prechambers or swirl chambers of indirect injection compression ignition engines operated on such fuel.

4,588,417

FUEL COMPOSITIONS

Edward F. Zaweski, and Leonard M. Miebylski, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Sep. 20, 1985, Ser. No. 778,020

Int. Cl.[4] C10L *1/18*

U.S. Cl. 44—57 **17 Claims**

1. Distillate fuel for indirect injection compression ignition engines containing at least the combination of (i) organic nitrate ignition accelerator, and (ii) diphenylamine or alkylated diphenylamine containing 1 or 2 alkyl groups, on one or both phenyl moieties, containing from 1 to 18 carbon atoms per group, said combination being present in an amount sufficient to minimize the coking characteristics of such fuel, especially throttling nozzle coking in the prechambers or swirl chambers of indirect injection compression ignition engines operated on such fuel.

4,588,418

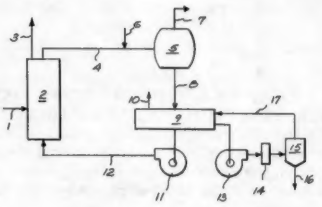
RECYCLE OF RECLAIMED WATER IN PARTIAL OXIDATION PROCESS

William A. Gabler, Seabrook, Tex., and Frank M. Julian, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 7, 1983, Ser. No. 464,617

Int. Cl.[4] C10J *3/46*

U.S. Cl. 48—197 R **1 Claim**



1. In a partial oxidation process for producing gaseous mixtures containing H_2, CO, water, soot, gaseous materials including one or more of CO_2, H_2S, COS, CH_4, NH_3 and N_2 and between 100 and 700 ppm ash particles comprising materials including vanadium, sulfur, nickel, iron, calcium, sodium, molybdenum, or their reaction products, the particles having an average particle size less than one micrometer, by the partial oxidation of a hydrocarbonaceous feed with an oxygen-containing gas; contacting the gaseous mixture with water in a gas quenching or scrubbing step or both; removing a water stream from this step containing soot; dissolved gaseous materials and suspended ash particles; adding a liquid organic extractant to the stream; feeding the stream to a decanter wherein aqueous and organic phase form; removing from the bottom of the decanter the aqueous phase containing water, dissolved gaseous material, soot and the suspended ash particles; feeding the dissolved aqueous phase to water flash separator wherein the dissolved gases are flashed off; and removing from the bottom of the water flash separator the remaining liquid phase for recycle to the quenching or scrubbing step and purging part of this liquid phase; the improvement comprising concentrating the suspended ash particles in the purge stream using a hydrocyclone having a maximum diameter of 10 mm.

4,588,419

RESIN SYSTEMS FOR HIGH ENERGY ELECTRON CURABLE RESIN COATED WEBS

Lawrence D. Caul, Buffalo, and Paul F. Forsyth, Niagara Falls, both of N.Y., assignors to Carborundum Abrasives Company, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 617,686, Jun. 6, 1984, Pat. No. 4,547,204, which is a division of Ser. No. 195,030, Oct. 8, 1980, Pat. No. 4,457,766. This application Feb. 8, 1985, Ser. No. 686,250

Int. Cl.[4] B24D *11/00*

U.S. Cl. 51—295 **19 Claims**

1. A coated abrasive wherein at least one layer is comprised of a mixture of an electron radiation curable resin system comprising an oligomer, filler and a diluent wherein the elec-

tron-curable resin is selected from urethane-acrylates or epoxy acrylates and a heat curable resin system wherein the heat

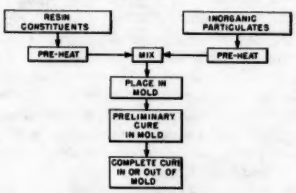
curable resin is selected from phenolic resins, melamine resins, amino resins, alkyd resins and furan resins.

4,588,420

METHODS OF MANUFACTURING ABRASIVE ARTICLES

Vernon K. Charvat, Bay Village, Ohio, assignor to Superior Finishers, Inc., Cleveland, Ohio

Filed Jul. 22, 1982, Ser. No. 399,592
Int. Cl.[4] B24D *11/00*
U.S. Cl. 51—298 **7 Claims**



1. The method of making molded abrasive articles comprising thermoset resins and discrete abrasive particles which comprises the steps of

(a) preheating a thermosetting organic resin and a catalyst for the resin to a temperature sufficient to reduce the viscosity of the resin and catalyst to less than 10 centipoises, the amount of resin and catalyst being at least 2.5% by volume in excess of that required to fill the interstices between the abrasive particles,

(b) preheating the discrete abrasive particles to a temperature above about 60° C.,

(c) mixing such heated abrasive particles with such preheated resin-catalyst mixture with agitation to wet such abrasive particles with the resin-catalyst mixture and release gas bubbles to form a flowable mixture free of abrasive particle agglomerations,

(d) discharging said flowable mixture into an open mold permitting continued release and escape of gas bubbles from such resin-catalyst and the particles in such mixture to settle to concentrate such particles closely together with the interstices therebetween substantially filled with such resin-catalyst mixture and thereby forming a thin upper superficial layer of substantially abrasive-free resin catalyst mixture above such concentrated particles in such mold, and

(e) curing the mixture in the mold to a solid article of desired shape.

4,588,421

AQUEOUS SILICA COMPOSITIONS FOR POLISHING SILICON WAFERS

Charles C. Payne, Aurora, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Continuation-in-part of Ser. No. 660,683, Oct. 15, 1984, abandoned. This application May 20, 1985, Ser. No. 736,056
Int. Cl.[4] B24B *1/00*
U.S. Cl. 51—308 **8 Claims**

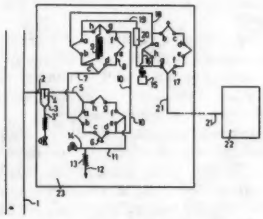
1. An improved method for polishing silicon wafers and like materials which comprises polishing them with a polishing agent comprising an aqueous colloidal silica sol or a gel which is combined with 0.1%–5% by weight of a piperazine or a lower alkyl nitrogen-substituted piperazine based on the SiO_2 content of the sol.

4,588,422

PROCESS AND EQUIPMENT FOR SAMPLING A GASEOUS EFFLUENT AND THEIR APPLICATION TO CHROMATOGRAPHY

Michel Raimond, Mormant, France, assignor to Elf France, Paris, France

Filed Dec. 7, 1983, Ser. No. 558,611
Int. Cl.[4] B01D *53/04*; G01N *31/08*
U.S. Cl. 55—67 **5 Claims**



1. A process for drawing off a sample of a main gaseous effluent stream containing solid particles for chromatographic analysis, said main gaseous effluent stream being at a first pressure higher than atmospheric pressure, said process comprising the following steps:

(a) forming a secondary stream of said gaseous effluent;

(b) sweeping a first part of a circuit comprising a capillary tube by said secondary stream of said gaseous effluent, and discharging said secondary stream to the atmosphere;

(c) connecting said first part of the circuit to atmosphere to bring the pressure of the entire first part of the circuit to atmospheric pressure, and discharging said secondary stream to the atmosphere through a second part of the circuit;

(d) sweeping said capillary tube by a carrier flowing from an auxiliary circuit in the same direction as that of the secondary stream in step (b), the discharge of said secondary stream being continued through said second part of the circuit;

(e) injecting a stream of steam followed by a drying gas stream into said first part of said circuit at a second pressure higher than said first pressure in the first part of said circuit, and in a direction opposite to that of the secondary sweeping stream of step (b), said carrier gas circulating in a direction opposite to that of its previous circulation in said auxiliary circuit.

4,588,423

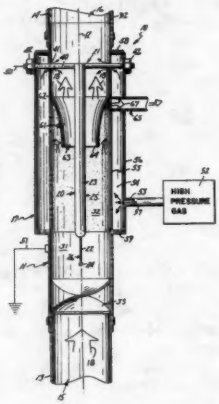
ELECTROSTATIC SEPARATOR

Gary R. Gillingham, Prior Lake, and James C. Rothman, Apple Valley, both of Minn., assignors to Donaldson Company, Inc., Minneapolis, Minn.

Continuation of Ser. No. 431,715, Jun. 30, 1982, abandoned. This application Jul. 25, 1984, Ser. No. 634,652

Int. Cl.[4] B03C *3/12, 3/14, 3/80*

U.S. Cl. 55—117 **13 Claims**



1. An apparatus for cleaning a flow of particulate-laden gas, comprising:

(a) a housing having a gas inlet for receiving particulate-laden gas and a gas outlet for discharging clean gas, said housing having an inner wall forming a passageway axially extending from said gas inlet to said gas outlet to permit a flow of gas therethrough;

(b) electrode means suspended axially in said passageway of said housing, said electrode means having a charging element adjacent to said gas inlet for charging particulate in said particulate-laden gas, said charging element defining with said inner wall of said housing a charging chamber in said housing, said electrode means further having an electrostatic force element adjacent to said gas outlet for subjecting said charged particulate to an electrostatic force, said electrostatic force element defining with said inner wall of said housing a collecting chamber in said housing, said inner wall of said housing being porous proximate said collecting chamber, said housing further including a nonporous outer wall spaced from said inner wall, said inner wall and said outer wall cooperating to form an enclosed cavity surrounding said collecting chamber, said electrostatic force element being constructed and arranged to inhibit formation of a corona when said electrode means and said housing are maintained at a voltage differential sufficient to cause a corona discharge from said charging element;

(c) voltage means electrically connected to said electrode means of said housing at a voltage differential sufficient to cause a corona discharge at said charging element for charging particulate located in said charging chamber and sufficient to subject particulate located in said collecting chamber to an electrostatic force, whereby the particulate is forced outwardly towards said housing, said voltage means including an electrical wire extending from a power supply externally located of said passageway to said electrode means;

(d) support means for supporting said electrode means in said housing, said support means including a dielectric member extending into said passageway of the housing, said electrical wire traveling within said dielectric member to said electrode means, said dielectric member extending through an aperture of larger diameter than said dielectric member in said inner wall so as to be separated from said inner wall by an air space surrounding said dielectric member at its intersection with said inner wall, said electrode means being secured to said dielectric member, said dielectric member being interconnected to said housing at a location along said dielectric member outside of said passageway;

(e) vortex means within said passageway of said housing intermediate of said collecting chamber and said gas inlet for imparting a rotating motion to the gas flow, whereby particulate is forced outwardly toward said inner wall;

(f) scavenge means within said passageway of said housing for separating particulate and agglomerated masses of particulate from the gas flow, said scavenge means comprising a generally frustoconical structure located in said collecting chamber proximate the end of said collecting chamber facing said gas outlet, said frustoconical structure having a base portion attached to said housing and further having an apex portion axially directed towards the gas inlet, said frustoconical structure further having an opening in said apex for allowing a flow of gas generally through the center of said frustoconical structure, said scavenge means further including an outlet extending from said passageway in said housing proximate said base portion of said frustoconical structure to the outside of said housing, said scavenge means outlet providing a secondary gas flow out of said housing from said passageway, said scavenge means outlet being positioned on the side of said base portion facing said gas inlet, said secondary gas flow including said separated particulate and agglomerated masses of particulate; and

(g) particulate removing means for removing particulate collected on the inside of said porous inner wall of said housing, said particulate removing means including means in communication with said enclosed cavity for introducing pressurized gas into said enclosed cavity surrounding said collecting chamber, whereby a radially inwardly flow of gas through said porous inner wall of said housing is caused thereby dislodging particulate and agglomerated masses of particulate from the inside of said porous inner wall of said housing.

4,588,424

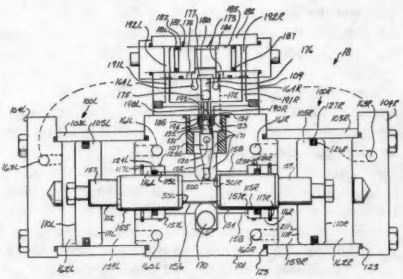
FLUID PUMPING SYSTEM

Rodney T. Heath, 4901 E. Main, Farmington, N. Mex. 87401, and Charles R. Gerlach, 639 W. Rhapsody, San Antonio, Tex. 78216

Filed Oct. 16, 1984, Ser. No. 661,398

Int. Cl.[4] B01D *53/26;* **F04B** *17/00*

U.S. Cl. 55—208 **16 Claims**



1. A fluid pumping system for use with a natural gas dehydrating system or the like having an absorber apparatus for removing water from wet natural gas to produce dry natural

gas by use of a desiccant agent such as glycol, and a glycol treater apparatus for producing a source of dry glycol from wet glycol received from the absorber apparatus comprising:

(a) main body means having a central bore therethrough for receiving elongate piston shaft means therethrough;

(b) elongate main piston shaft means reciprocally slideably mounted in said main body means central bore;

(c) first and second cylinder means removeably mounted on opposite sides of said main body means in annular centered relationship with respect to said piston shaft means, said first and second cylinder means defining, respectively, a first and second cylindrical cavity;

(d) first and second main piston means mounted at opposite ends of said piston shaft means and sealingly slidingly received within said first and second cylinder means, respectively, each said piston means dividing each associated cylinder means cavity into a pumping chamber for receiving low pressure dry glycol from the glycol treater apparatus and for pumpingly exhausting high pressure dry glycol to the absorber apparatus, and a driving chamber for drivingly receiving high pressure wet glycol from the absorber apparatus and discharging low pressure wet glycol to the treater apparatus, whereby a first and second dry glycol pumping chamber and a first and second wet glycol driving chamber are provided;

(e) each said first and second dry glycol pumping chamber being operatively associated, respectively, with a first and second pumping chamber inlet means in fluid communication with the treater apparatus for allowing an inflow of low pressure dry glycol, and being operatively associated, respectively, with a first and second pumping chamber outlet means in fluid communication with the absorber apparatus for allowing a discharge of high pressure dry glycol to the absorber apparatus;

(f) each said first and second wet glycol driving chamber being operatively associated with a first and second reversible orifice means, respectively, each reversible orifice means having an inflow operating position wherein an associated driving chamber is placed in fluid communication with wet glycol in said absorber apparatus for providing an inflow of wet glycol to said driving chamber and having an outflow operating position wherein an associated driving chamber is placed in fluid communication with the treater apparatus for allowing an exhaust of wet glycol from said driving chamber, the operating positions of said first and second reversible orifice means being in opposite phase with one another whereby when one driving chamber is receiving a wet glycol inflow, the other driving chamber is discharging wet glycol whereby said piston means and said piston shaft means are driven back and forth in a reciprocating motion by inflow of wet glycol into alternating ones of said first and second driving chambers.

12. A fluid pumping system for use with a natual gas dehydrating system or the like having an absorber apparatus for removing water from wet natual gas to produce dry natural gas by use of a dessicant agent such as glycol, and a glycol treater apparatus for producing a source of dry glycol from wet glycol received from the absorber apparatus the system comprising:

a fluid pump means operatively connected between dry glycol source and absorber apparatus for pumping dry glycol from the dry glycol source to the absorber apparatus;

a fluid operable piston motor means operatively associated with said pump means for driving said pump means and having fluid inlet passage means for receiving wet glycol from said absorber and fluid outlet passage means for delivering wet glycol to said glycol reboiler means wherein energy derived from the flow of fluid passing through said fluid inlet passage means provides the entire motivating force for said motor means and said pump means;

said fluid pump means comprising a first pair of equal diameter chamber portion of a double acting piston means having a piston rod with two oppositely positioned piston heads at terminal ends thereof received within two oppositely positioned cylinders mounted on a fixed central body which slidably supports said piston rod; said fluid operable motor means comprising a second pair of equal diameter chamber portions of said double acting piston means; the effective areas of outwardly directed faces of said piston heads being substantially greater than the effective areas of inwardly directed faces of said piston heads; and

a wet glycol passage shifting means associated with said fluid motor means for automatically changing the porting of said fluid motor means at the end of a piston stroke for producing reciprocal piston motion in said fluid motor means including toggle means actuated by said piston rod.

4,588,425

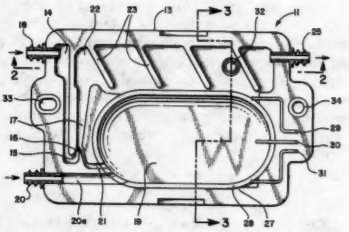
HUMIDIFIER

Joe Usry, Midvale; Roger Atkins, Salt Lake City, and Chris Faddis, West Valley City, all of Utah, assignors to Bunnell Life Systems, Inc., Salt Lake City, Utah

Continuation of Ser. No. 549,789, Nov. 8, 1983, abandoned. This application Mar. 26, 1985, Ser. No. 716,199

Int. Cl.[4] B01D *47/00*

U.S. Cl. 55—227 **12 Claims**



1. A humidifier which includes

a housing having an air passage defined therein, said air passage including

a venturi section comprising a convergent segment, a narrow throat, and a divergent segment, and

a scrubber area for receiving air and water vapor from the divergent segment,

a water reservoir defined in the housing at a location below the scrubber area to receive water droplets therefrom, and such that the venturi section is below the water level in the reservoir,

a narrow channel connecting the reservoir with the throat of the venturi section to carry water to the venturi section to thereby vaporize at least a portion of the water,

means for heating water in the water reservoir, and

wherein the housing includes two plates of transparent plastic positioned in a side-by-side relationship, with the air passage and reservoir being defined in facing surfaces of the plates.

4,588,426

AIR FILTER FOR INTERNAL COMBUSTION ENGINE

Jacques Virgille, Seloncourt; Francois Jodry, Herimoncourt, and Antoine Juglair, Valentigney, all of France, assignors to Aciers et Outillage Peugeot, Audincourt, France

Filed Jun. 4, 1984, Ser. No. 616,749

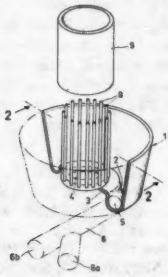
Claims priority, application France, Jun. 2, 1983, 83 09195

Int. Cl.[4] B01D *50/00*

U.S. Cl. 55—337 **7 Claims**

1. A filter for filtering combustion air of an internal combustion engine, said filter comprising a case having a generally

cup-shaped body (1) with a base and a wall extending from said base, and a cover (10) which caps said body, said base having a raised portion (3) surrounded by an annular groove (5) and a pipe (6) which constitutes an inlet opening of the filter, said pipe opening onto said annular groove tangentially of said annular groove, said case defining a filtering chamber provided with openings including the inlet opening (6) and an outlet opening (4) arranged coaxially in the base, a generally cylindrically shaped filter cartridge (9) with open opposite ends and of



a flexible material through which cartridge said openings communicate with each other, and means for supporting said cartridge so that it preserves the integrity of its shape, said supporting means comprising a ring arrangement of a series of parallel rods (8) with respect to which rods said cartridge is supported, said rods being disposed about a circle extending around the outlet opening of the case said circle being coaxial with said outlet opening, said rods being integrally moulded with said case, said rods being free relative to each other at one end thereof.

4,588,427

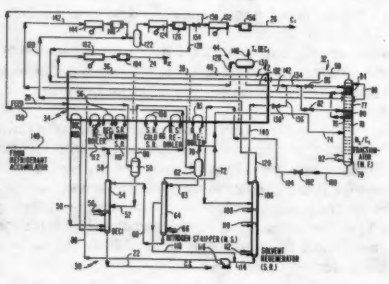
METHOD AND APPARATUS FOR PURIFICATION OF HIGH N_2 CONTENT GAS

Jame Yao; Jong J. Chen, and Douglas G. Elliot, all of Houston, Tex., assignors to DM International Inc., Tulsa, Okla.

Filed Mar. 13, 1985, Ser. No. 711,368

Int. Cl.[4] F25J *3/02*

U.S. Cl. 62—17 **11 Claims**



1. A method for separating nitrogen from methane in a gaseous mixture including nitrogen and methane, comprisng the steps of

cooling the gaseous mixture to a temperature below the boiling point of methane but above the boiling point of nitrogen,

feeding the cooled mixture to a nitrogen-methane cryogenic fractionator to provide methane condensation,

injecting into the fractionator a distillative aid including a liquid material selected from the group consisting of ethane, propane, isobutane, normal butane and mixtures thereof to increase the critical pressure for the mixture sufficient to reduce product recompression costs, to increase the relative volatility of nitrogen to methane, and to aid condensation by absorbing a portion of the methane,

passing a bottoms fraction from the nitrogen-methane cryogenic fractionator including a mixture of distillative aid and liquid methane to a regenerator,

heating the mixture of distillative aid and liquid methane in the regenerator to form an overhead stream of methane and a bottoms fraction of distillative aid,

cooling and returning the bottoms fraction of distillative aid for the above injection into the nitrogen-methane cryogenic fractionator sufficient to provide condensation of methane which results in a reduced circulation rate for the distillative aid,

withdrawing methane from the regenerator as product, and

withdrawing nitrogen overhead from the nitrogen-methane cryogenic fractionator.

8. An apparatus for separating nitrogen from methane comprising

means for cooling the gaseous mixture of nitrogen and methane to a temperature below the boiling point of methane but above the boiling point of nitrogen,

nitrogen-methane cryogenic factionator means for receivng the cooled mixture of nitrogen and methane,

condenser means for condensing methane in the fractionator means,

means for injecting a distillative aid including a material selected from the group consisting of ethane, propane, isobutane, normal butane and mixtures thereof as a reflux stream into the nitrogen-methane cryogenic fractionator means to increase the critical pressure for the mixture sufficient to reduce product recompression costs,

means for withdrawing a mixture of distillative aid and liquid methane from a bottom of the cryogenic nitrogen-methane fractionator means,

a regenerator for receiving the withdrawn mixture of distillative aid and liquid methane to heat the mixture to drive off methane as overhead and produce a lean distillative aid bottoms product, and

means for cooling and recirculating the lean distillative aid from the regenerator to the nitrogen-methane cryogenic fractionator means for providing condensation of methane which results in a reduced circulation rate for the distillative aid.

4,588,428

CONTROL METHOD FOR A LIQUID COOLED CABLE INSTALLATION

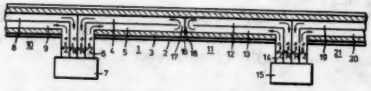
Karl W. Kanngiesser, Vierheim, Fed. Rep. of Germany, assignor to BBC Aktiengesellschaft Brown, Boveri & Cie AG, Baden, Switzerland

Filed Oct. 11, 1984, Ser. No. 659,656

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1983, 3336842

Int. Cl.[4] F25D *17/02;* H01B *7/34*

U.S. Cl. 62—99 **12 Claims**



1. Control method for controlling the field strength in a cable dielectric of a liquid-cooled cable installation with a hollow conductor as the cable conductor and an outer insulating layer as the cable dielectric without the danger that voltage breakdowns may occur due to an increase of the field strength, which comprises; flowing coolant through the hollow space of the cable conductor which is divided in the longitudinal direction by partitions to form separate canals for outgoing flow of coolant and return of coolant, with the coolant flowing in the

canals in contact with the conductor at high voltage potential, and flowing coolant through a heat exchanger, the combination therewith of lowering the cable outgoing flow temperature (θ_Z) of the coolant with increasing load of the cable by means of the heat exchanger and conversely with falling load raising the cable outgoing flow temperature (θ_Z) of the coolant, to maintain the mean value of the coolant (θ_m) constant.

4,588,429

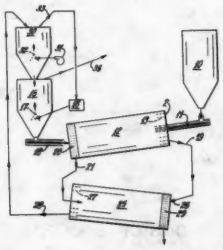
METHOD OF HEATING PARTICULATE MATERIAL WITH A PARTICULATE HEATING MEDIA

Charles M. Hohman; Mark A. Propster, both of Granville, and Stephen Seng, Frazeysburg, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation-in-part of Ser. No. 633,682, Jul. 25, 1984, abandoned, which is a continuation of Ser. No. 556,767, Dec. 1, 1983, abandoned, which is a continuation of Ser. No. 492,311, May 6, 1983, Pat. No. 4,425,147, which is a continuation of Ser. No. 330,064, Dec. 14, 1981, Pat. No. 4,386,951, which is a continuation of Ser. No. 181,589, Aug. 27, 1980, Pat. No. 4,319,903. This application Nov. 29, 1984, Ser. No. 676,466

Int. Cl.[4] C03B *1/00*

U.S. Cl. 65—27 **7 Claims**



1. The method of heat processing a granular material comprising the steps of:

(a) heating a body of particulate heat transfer media in a hopper to a processing temperature T1;

(b) flowing hot media from said hopper and at said temperature T1 upwardly through a processing drum rotatable about an inclined axis with the media being removed from the upper end of the drum, while simultaneously flowing the granular material to be processed downwardly through the drum for removal from the lower end of the drum, the granular material and the media being in intimate heat transfer contact during their counterflow through the drum to heat the granular material to a processing temperature T2, with the media issuing from the drum at a temperature T3 which is less than either of the temperatures T1 and T2;

(c) introducing the media from the processing drum at the temperature T3 into the upper end of a heat recovery drum rotatable about an inclined axis and simultaneously introducing the granular material at the temperature T2 into the lower end of said heat recovery drum, counterflowing the granular material and the media through the heat recovery drum, removing the granular material from the lower end of the drum at a temperature which is less than the temperature T2 and removing the media from the upper end of the drum at a temperature T4 which is greater than the temperature T3; and

(d) returning the media to said hopper at the temperature T4 for reheating to its processing temperature T1.

4,588,430

METHOD OF MANUFACTURING A GLASS PRODUCT AND RESULTING PRODUCT

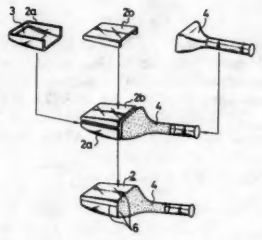
Hiroji Sumiyoshi, Sagamihara; Makoto Maeda, Tama, and Takashi Aoki, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 533,668, Sep. 19, 1983, abandoned. This application May 1, 1985, Ser. No. 729,883

Claims priority, application Japan, Sep. 25, 1982, 57-167320

Int. Cl.[4] C03B *23/24*

U.S. Cl. 65—56 **4 Claims**



1. A method of manufacturing a glass envelope for a flat type cathode ray tube having a screen panel, a mating panel, and a funnel portion extending from said panels, at least one of said panels having an asymmetrical shape, comprising the steps of:

molding in a single molding operation a glass product having a symmetrical shape;

dividing said glass product so as to provide one of said panels having an asymmetrical shape, and

sealing said screen panel, said mating panel and said funnel portion together to form said envelope.

4,588,431

MIXED PHOSPHATIC FERTILIZER AND PROCESS FOR PRODUCING THE SAME

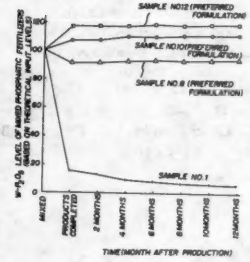
Teruo Nakamura; Michio Kiyoto; Kazuo Akashi, and Isao Hasegawa, all of Tokyo, Japan, assignors to Japan Metals and Chemicals Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 338,078, Jan. 8, 1982, abandoned, which is a division of Ser. No. 333,441, Dec. 22, 1981, Pat. No. 4,440,560, which is a continuation of Ser. No. 185,741, Sep. 10, 1980, abandoned. This application Apr. 8, 1985, Ser. No. 720,064

Claims priority, application Japan, Dec. 13, 1979, 54-161841

Int. Cl.[4] C05B *21/00*; C05F *11/02*

U.S. Cl. 71—24 **1 Claim**



1. A process for producing a mixed phosphatic fertilizer, said process comprising: adding 17.65–100 parts by weight of humic acid produced by oxidizing and decomposing ground lignite or brown coal with nitric acid 80–98 parts by weight of fused phosphate containing alkaline ingredients to cause said

humic acid to react with and complex said alkaline ingredients and form a mixture, then mixing with said mixture 20–2 parts by weight of a composition selected from the group consisting of calcium superphosphate, calcium triple-superphosphate, phosphoric acid and mixtures thereof, the total parts by weight of said fused phosphate and said composition being 100, thereby producing said mixed phosphatic fertilizer with stabilized predetermined levels of citric acid-soluble and water-soluble phosphoric acid contents.

4,588,432

HERBICIDAL SELENYLSULFONAMIDES

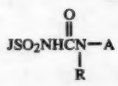
Craig L. Hillemann, Wilmington, Del., assignor to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 583,975, Feb. 27, 1984, abandoned. This application Dec. 11, 1984, Ser. No. 680,949

Int. Cl.[4] **C07D** *239/46;* **A01N** *47/36*

U.S. Cl. 71—92 **15 Claims**

1. A compound having the formula:

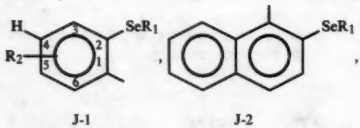


I

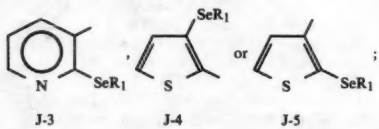
wherein

R is H or CH_3;

J is



J-1 J-2



J-3 J-4 J-5

R_1 is C_1–C_4 alkyl, C_3–C_4 alkenyl, C_3–C_4 alkynyl, CF_2H or $CH_2CH_2OCH_3$;

R_2 is H, C_1–C_3 alkyl, C_1–C_3 haloalkl, halogen, nitro, SeR_1, C_1–C_3 alkoxy, $SO_2NR^IR^{II}$, C_1–C_3 alkylthio, C_1–C_3 alkylsulfinyl, C_1–C_3 alkylsulfonyl or CO_2R^{III};

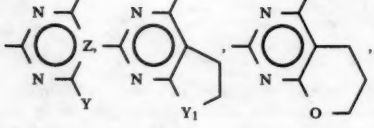
R^I is H, C_1–C_4 alkyl, C_2–C_3 cyanoalkyl, methoxy or ethoxy;

R^{II} is H, C_1–C_4 alkyl or C_3–C_4 alkenyl; or

R^I and R^{II} may be taken together as $—(CH_2)_3—$, $—(CH_2)_4—$, $—(CH_2)_5—$ or $—CH_2CH_2OCH_2CH_2—$;

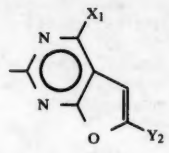
R^{III} is C_1–C_4 alkyl, C_3–C_4 alkenyl, C_3–C_4 alkynyl, C_2–C_4 haloalkyl, C_1–C_3 cyanoalkyl, C_5–C_6 cycloalkyl, C_4–C_7 cycloalkylalkyl or C_2–C_4 alkoxyalkyl;

A is



A-1 A-2 A-3

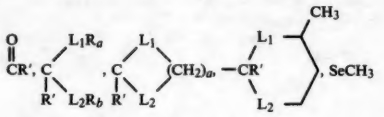
-continued



A-4

X is H, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 haloalkoxy, C_1–C_4 haloalkyl, C_1–C_4 haloalkylthio, C_1–C_4 alkylthio, halogen, C_2–C_5 alkoxyalkyl, C_2–C_5 alkoxyalkoxy, amino, C_1–C_3 alkylamino or di(C_1–C_3 alkyl)amino;

Y is H, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 haloalkoxy, C_1–C_4 haloalkylthio, C_1–C_4 alkylthio, halogen, C_2–C_5 alkoxyalkyl, C_2–C_5 alkoxyalkoxy, amino, C_1–C_3 alkylamino, di(C_1–C_3-alkyl)amino, C_3–C_4 alkenyloxy, C_3–C_4 alkynyloxy, C_2–C_5 alkylthioalkyl, C_1–C_4 haloalkyl, C_3–C_5 cycloalkyl, C_2–C_4 alkynyl,



or $N(OCH_3)CH_3$;

a is 2 or 3;

L_1 is O or S;

L_2 is O or S;

R_a is C_1–C_2 alkyl;

R_b is C_1–C_2 alkyl;

R′ is H or CH_3;

Z is CH;

Y_1 is CH_2 or O;

X_1 is CH_3, OCH_3, OCH_2CH_3 or OCF_2H;

Y_2 is H or CH_3;

(1) provided that when X is Cl, F or Br, then Y is OCH_3, OCH_2CH_3, NH_2, $NHCH_3$, $N(CH_3)_2$ or OCF_2H;

(2) when Y is $SeCH_3$, then X is CH_3, OCH_3, OCH_2CH_3, OCF_2H or CF_3; and

(3) when R_2 is SeR_1 or CO_2R^{III}, then it is attached to position 6 of J-1.

4,588,433

PHENOXYMETHANE DERIVATIVES FOR REGULATING PLANT GROWTH

Hans-Georg Schmitt, Leverkusen; Klaus Lürssen, Bergisch-Gladbach, and Karlfried Wedemeyer, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

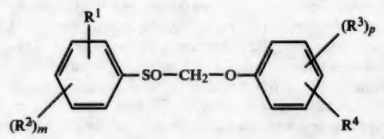
Filed Feb. 21, 1984, Ser. No. 582,121

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1983, 3306201; Dec. 7, 1983, 3344235

Int. Cl.[4] **C07C** *149/40, 147/107;* **A01N** *31/14*

U.S. Cl. 71—98 **28 Claims**

1. Plant growth regulant composition comprising as an active ingredient a plant growth regulating effective amount of at least one phenoxymethane derivative of the formula



in which

R^1 represents hydrogen, alkyl, alkoxy, halogenoalkyl, halogenoalkoxy, alkoxycarbonyl, cycloalkoxycarbonyl or nitro,

R^2 represents hydrogen or alkyl,

R^3 represents hydrogen, alkyl, alkenyl, alkinyl, phenyl which is optionally substituted by alkyl and/or halogen, phenylalkyl which is optionally substituted by alkyl and/or halogen, alkoxy, phenoxy, halogenoalkyl, halogenoalkoxy, alkylthio, halogenoalkylthio, alkylsulphonyl, phenylthio, phenylsulphonyl or nitro,

R^4 represents hydrogen, alkyl, cycloalkoxycarbonyl, aminocarbonyl, alkylaminocarbonyl, dialkylaminocarbonyl, cycloalkylaminocarbonyl, dicycloalkyl-aminocarbonyl, phenoxycarbonyl which is optionally substituted by halogen and/or alkyl, cyano or the radical of the formula —COOR,

wherein

R represents hydrogen, an alkali metal cation, one equivalent of an alkaline earth metal cation, alkyl, alkenyl, alkoxyalkyl, alkylthioalkyl or the radical of the formula $—CH_2—O—(CH_2—CH_2O)_q—Alk$

wherein

Alk represent alkyl and

q represents 0, 1 or 2,

m represents 1, 2 or 3,

p represents 1, 2 or 3 and a plant growth regulant compatible diluent.

4,588,434

SUBSTITUTED UREAS AND THEIR USE FOR CONTROLLING UNDESIRABLE PLANT GROWTH

Arno Lange, Bad Durkheim, and Bruno Wuerzer, Otterstadt, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

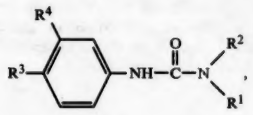
Filed Dec. 7, 1983, Ser. No. 559,181

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1982, 3245679

Int. Cl.[4] A01N *37/00*; C07C *153/023*

U.S. Cl. 71—100 **10 Claims**

1. A substituted urea of the formula



(I)

where R^1 is hydrogen or C_1–C_4-alkyl, R^2 is hydrogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_2–C_4-alkenyl, C_2–C_4-alkynyl, unsubstituted or C_1–C_4-alkyl-substituted C_3–C_7-cycloalkyl, or phenyl which is unsubstituted or substituted by halogen or by C_1–C_4-haloalkyl, R^3 is hydrogen, halogen or a radical —CO—S—R where R is C_1–C_{10}-alkyl, C_3–C_8-cycloalkyl, C_2–C_4-alkenyl, C_2–C_4-alkynyl or C_7–C_{12}-aralkyl and R^4 is hydrogen, halogen or a radical —CO—S—R, where R is C_1–C_{10}-alkyl, C_3–C_8-cycloalkyl, C_2–C_4-alkenyl, C_2–C_4-alkynyl or C_7–C_{12}-aralkyl, with the proviso that one or both of the substituents R^3 and R^4 are —CO—S—R.

10. A process for combating the growth of unwanted plants, wherein the unwanted plants or the area to be kept free from unwanted plant growth are treated with a herbicidally effective amount of a substituted urea of the formula I as defined in claim **1**.

4,588,435

N-SUBSTITUTED AMINO PROPANE SULFONIC ACID DERIVATIVES AND PLANT GROWTH REGULATING USE

Zoltán Budai; Attila Kis-Tamás; Aranka Lay née Kónya; Zoltán Vig; Viktor Andriska, and Tibor Mezei, all of Budapest, Hungary, assignors to EGYT Gyogyszervegyeszeti Gyar, Budapest, Hungary

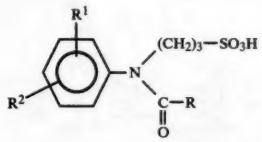
Filed Jan. 31, 1985, Ser. No. 696,658

Claims priority, application Hungary, Feb. 3, 1984, 448/84

Int. Cl.[4] A01N *37/22, 43/08*; C07C *143/63*; C07D *307/68*

U.S. Cl. 71—103 **17 Claims**

1. A compound of the Formula I



I

wherein

R^1 and R^2 may be identical or different and stand for hydrogen, halogen, lower alkyl or lower alkoxy and

R stands for furyl, halogen substituted lower alkyl, phenyl and halogen substituted phenyl and hydrates and salts thereof.

6. A plant growth regulating composition comprising as active ingredient an effective amount of at least one compound of the Formula I as defined in claim **1**, in admixture with a suitable inert solid or liquid carrier or diluent.

4,588,436

METHOD OF RECOVERING METALS FROM LIQUID SLAG

Sune Eriksson, Hofors, and Gotthard Björling, Djursholm, both of Sweden, assignors to SKF Steel Engineering, AB, Hofors, Sweden

Continuation of Ser. No. 460,654, Jan. 24, 1983, abandoned. This application Jan. 2, 1985, Ser. No. 688,265

Claims priority, application Sweden, Apr. 7, 1982, 8202224

Int. Cl.[4] C21B *13/12*; C22B *4/00*

U.S. Cl. 75—10 R **9 Claims**

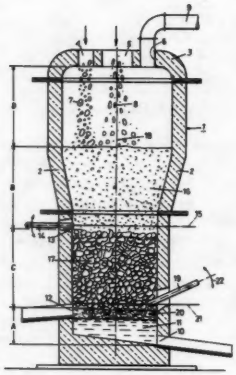
1. A method of recovering oxide-bound or silicate-bound metal in metallic or sulphidic form from liquid slag containing metal oxides, metal silicates or metal sulphides comprising the steps of maintaining the liquid slag in the form of a bath in a furnace, providing a recirculation gas and heating said recirculation gas by passing said gas through a plasma generator, thereafter blowing said heated gas together with a carbonaceous reducing agent and/or a sulphidizing agent into the bath of liquid slag below the surface thereof, providing sufficient heat energy by means of the plasma generator such that substantially no combustion of carbon is required to provide the heat necessary to cause the endothermic reduction of the metal oxide, causing the carbon in the carbonaceous reducing agent to react with the metal oxides or silicates in the slag and to reduce said metal oxides or silicates to metal vapor, liquid metal or metal sulphide, depending upon the composition of the slag, allowing reduced metal vapor formed in the slag to pass upwardly through the molten slag in the form of bubbles and allowing liquid metal or metal sulphide formed in the slag to form droplets in the slag, controlling the temperature and oxygen potential in the recirculation gas so as to prevent substantial re-oxidation of the reduced metal vapor, liquid metal or metal sulphide, collecting metal vapor as formed above the slag surface and condensing said metal vapor in a condensor and separating said droplets of liquid metal or metal sulphide as formed from the slag.

4,588,437

METHOD FOR PRODUCING MOLTEN PIG IRON OR STEEL PRE-PRODUCTS IN A MELT-DOWN GASIFIER

Werner Kepplinger, Linz-Hart, Austria, and Rolf Hauk, Achern, Fed. Rep. of Germany, assignors to Korf Engineering GmbH, Dusseldorf, Fed. Rep. of Germany and Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Dec. 20, 1983, Ser. No. 563,359
Claims priority, application Austria, Dec. 21, 1982, 4618/82
Int. Cl.[4] C21B *11/08*
U.S. Cl. 75—43 15 Claims



1. A method of producing molten pig iron or steel preproducts and reduction gas in a melt-down gasifier in which molten pig iron or steel preproducts and a superposed slag bath are collected at the bottom of said gasifier, which method comprises the steps of

forming a first zone comprised of a fluidized-bed of coke particles by adding coal and blowing in oxygen-containing gas in a first blow-in plane, said blown-in gas inducing relatively heavy motion of the coke particles above said first blow-in plane,

adding from above to said first fluidized bed zone ferrous material comprised of at least one of iron sponge particles, and pre-reduced iron ore particles, with a substantial portion of particle sizes of more than 3 mm,

blowing in oxygen-containing gas in a second blow-in plane below said first blow-in plane and above the level of said slag bath,

regulating the gas supply blown in at said second blow-in plane to form a second zone between said first blow-in plane and said second blow-in plane, said second zone being comprised of a fluidized bed of coke particles whose motion is weak or unnoticeable relative to the motion of the coke particles in said first zone,

maintaining the temperature in said second zone above the melting temperature of said ferrous material, and

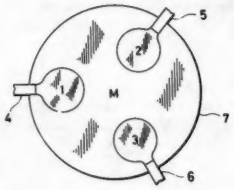
drawing off the collected molten pig iron or steel preproducts.

4,588,438

MOULDED OBJECT OF ALUMINA MATTER-CONTAINING RAW MATERIAL FOR ALUMINUM SMELTING BY BLAST FURNACE METHOD

Masao Fujishige; Masayuki Dokiya; Tetsuya Kameyama; Harumi Yokokawa; Seiichi Ujiie, and Kenzo Fukuda, all of Yatabemachi, Japan, assignors to Agency of Industrial Science and Technology, Tokyo, Japan

Division of Ser. No. 523,569, Aug. 16, 1983, abandoned. This application Dec. 27, 1984, Ser. No. 685,229
Claims priority, application Japan, Aug. 24, 1982, 57-146419
Int. Cl.[4] C22B *21/02*
U.S. Cl. 75—68 A 12 Claims



1. A method of smelting aluminum by a blast furnace method, which comprises the steps of:

A. kneading together powder of an alumina matter-containing raw material, iron, and powder of a carbon material in the presence of a binder, in such an amount so that the atomic ratio for Fe/Al is at least 1/17, and for Fe/Si is at least 1, based on any silicon component present in the alumina matter-containing raw material, so that the evolution of volatile components is restrained molding the kneaded mixture and drying the molded mixture,

B. forming on the surface of the molded and dried mixture a layer of a paste of a carbon material and a binder, followed by drying and then baking the resultant surface-treated mixture, to prepare a finished molded object,

C. charging fuel coke in a blast furnace, and with an oxygen-containing gas circumferentially introduced into the furnace, burning the fuel coke to produce an oxidizing region within the furnace, while producing a reducing region in the vicinity of the center of the furnace in which combustion of the fuel coke does not take place,

D. then supplying said finished molded object from the above step B into said reducing region within the furnace to cause to be reduced the alumina matter-containing raw material present in said finished molded object, and then taking aluminum in the form of an aluminum-iron alloy from a bottom portion of the blast furnace.

4,588,439

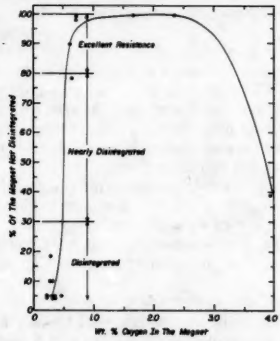
OXYGEN CONTAINING PERMANENT MAGNET ALLOY

Kalathur S. V. L. Narasimhan, Monroeville; Carol J. Willman, Bethel Park, and Edward J. Dulis, Upper St. Clair, all of Pa., assignors to Crucible Materials Corporation, Pittsburgh, Pa.

Filed May 20, 1985, Ser. No. 736,017
Int. Cl.[4] C22C *33/00*
U.S. Cl. 75—123 B 6 Claims

1. A permanent magnet alloy consisting essentially of, in

weight percent, 30 to 36 of at least one rare earth element, 60 to 66 iron, 6,000 to 35,000 ppm oxygen and balance boron.



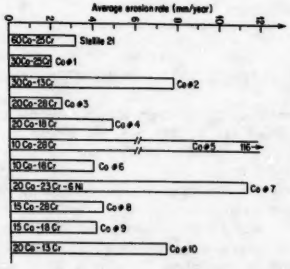
4. A permanent magnet alloy consisting essentially of, in weight percent, 30 to 36 of at least one rare earth element, 60 to 66 iron, 9,000 to 30,000 ppm oxygen, and balance boron.

4,588,440

CO CONTAINING AUSTENITIC STAINLESS STEEL WITH HIGH CAVITATION EROSION RESISTANCE

Raynald Simoneau, St-Bruno, Canada, assignor to Hydro Quebec, Montreal, Canada

Filed Jul. 30, 1984, Ser. No. 635,410
Claims priority, application Canada, Jun. 28, 1984, 457755
Int. Cl.[4] C22C *38/42, 38/52, 38/58*
U.S. Cl. 75—126 B **16 Claims**



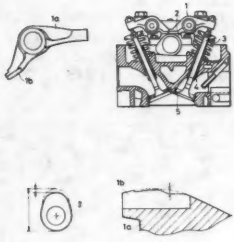
1. A stainless steel alloy showing a high cavitation erosion resistance, said alloy consisting essentially of:
from 8 to 30% by weight of Co;
from 13 to 30% by weight of Cr;
from 0.03 to 0.3% by weight of C;
up to 0.3% by weight of N;
up to 3% by weight of Si;
up to 1% by weight of Ni;
up to 2% by weight of Mo; and
up to 9% by weight of Mn;
the balance being substantially Fe,
wherein the amount of the above mentioned elements that are respectively known as ferrite formers (Cr, Mo, Si) and as austenite formers (C, N, Co, Ni, Mn) and, amongst said austenite and ferrite formers, the amount of each of the elements that are respectively known to increase and lower the stacking fault energy (Ni, C, Co Si, Mn, N), are respectively selected and balanced so that at least 60% by weight of the alloy is, at ambient temperature, in a metastable, face centered cubic phase having a stacking fault energy low enough to make it capable of being transformed under cavitation exposure to a fine deformation twinning, hexagonal close pack ϵ-phase and-/or α-martensitic phase.

4,588,441

PROCESS FOR THE PREPARATION OF SINTERED ALLOYS FOR VALVE MECHANISM PARTS FOR INTERNAL COMBUSTION ENGINES

Yutaka Ikenoue, 5-4-2, Tokiwadaira, Matsudo-shi, Chiba-ken; Hiroyuki Endoh, 741-3, Tsukushino, Abiko-shi, Chiba-ken, and Tadao Hayasaka, 1-13-10, Kaga-cho, Kashiwa-shi, Chiba-ken, all of Japan

Filed Jan. 31, 1984, Ser. No. 575,713
Claims priority, application Japan, Feb. 8, 1983, 58-20292
Int. Cl.[4] B22F *3/16;* **C22C** *33/02, 38/12, 38/16*
U.S. Cl. 75—230 **19 Claims**



1. A process for the preparation of an iron-base sintered alloy, well suited for use in valve mechanism members of parts of internal combustion engines, which has a porosity of from 5 to 15% and throughout the iron matrix of which is dispersed from 5 to 25% of an Fe-Mo intermetallic compound in the form of a phase harder than the said matrix,

which comprises admixing iron powder with an effective amount of each of phoshorus-containing alloy powder, carbon powder, Fe-Mo alloy powder, and at least one powder selected from the group consisting of copper powder, bronze (copper and tin alloy) powder and a combination of copper powder and tin powder; forming the resulting composition into a green compact having a density ratio of 70–90%, pre-sintering the green compact at a temperature of from 300°–900° C., repressing the pre-sintered green compact until a density ratio of from 90–95% is reached, and finally sintering the repressed bodies at a temperature of from 1030°–1130° C. in a reducing atmosphere.

2. A process according to claim 1 wherein the iron powder is atomized iron powder.

14. An iron-base green compact having a density ratio of from 70 to 90 percent and comprising:

from 5 to 20 percent of copper or copper alloy powder,

from 0.2 to 1.5 percent (calculated as elemental phosphorus) of Fe-P alloy powder or Cu-P alloy powder,

from 1 to 3 percent of carbon powder, and

from 3 to 15 percent (calculated as elemental molybdenum) of Fe-Mo powder.

4,588,442

REFRACTORY COMPOSITION

Colin Richmond, Stonewalls, Rosemary Lane, Burton, Rosset, Clwyd, Wales, and Michael E. Bennett, 21 Forest Road, Claughton, Birkenhead Merseyside, England

PCT No. PCT/GB83/00204, § 371 Date Apr. 18, 1984, § 102(e) Date Apr. 18, 1984, PCT Pub. No. WO84/00747, PCT Pub. Date Mar. 1, 1984

PCT Filed Aug. 15, 1983, Ser. No. 606,811

Claims priority, application United Kingdom, Aug. 20, 1982, 8223995

Int. Cl.[4] B29B *7/36;* **C04B** *35/68*

U.S. Cl. 106—38.27 **8 Claims**

1. In a refractory composition for in situ firing to form a refractory lining, the refractory composition comprising refractory aggregate and refractory clay binder, the improvement comprising effective amounts of less than 0.1% by weight each of finely divided metallic powder and short length organic fibers for increasing the spalling resistance during said in situ firing.

4,588,443

SHAPED ARTICLE AND COMPOSITE MATERIAL AND METHOD FOR PRODUCING SAME

Hans H. Bache, Hjallerup, Denmark, assignor to Aktieselskabet Aalborg Pottland-Cement-Fabrik, Aalborg, Denmark

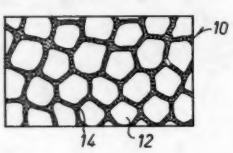
PCT No. PCT/DK81/00048, § 371 Date Dec. 30, 1981, § 102(e) Date Dec. 30, 1981, PCT Pub. No. WO81/03170, PCT Pub. Date Nov. 12, 1981

PCT Filed May 1, 1981, Ser. No. 336,380

Claims priority, application Denmark, May 1, 1980, 1945/80; Feb. 6, 1981, 538/81; Feb. 27, 1981, 907/81

Int. Cl.[4] B32B *13/00;* **C04B** *15/00, 31/00*

U.S. Cl. 106—97 **61 Claims**



1. A shaped article comprising a coherent matrix, the matrix comprising

(A) homogeneously arranged inorganic solid particles of a size of from about 50 Å to about 0.5μ, or a coherent structure formed from such homogeneously arranged particles, and

(B) densely packed solid particles having a size of the order of 0.5–100μ and being at least one order of magnitude larger than the respective particles stated under (A), or a coherent structure formed from such densely packed particles,

the particles A or the coherent structure formed therefrom being homogeneously distributed in the void volume between the particles B,

the dense packing being substantially a packing corresponding to the one obtainable by gentle mechanical influence on a system of geometrically equally shaped large particles in which locking surface forces do not have any significant effect,

and a surface active dispersing agent effective to secure the homogeneous distribution of particles A and being present in an amount sufficient to secure the homogeneous distribution of particles A, the shaped article additionally comprising embedded in the matrix,

(C) compact-shaped solid particles of a material having a strength exceeding that of ordinary sand and stone used for ordinary concrete, typically a strength corresponding to at least one of the following criteria:

(1) a die pressure of about 30 MPa at a degree of packing of 0.70, above 50 MPa at a degree of packing of 0.75, and above 90 MPa at a degree of packing of 0.80, (on particles of the material having a size ratio between the largest and smallest particle substantially not exceeding 4 mm),

(2) a compressive strength of a composite material with the particles embedded in a specified matrix exceeding 170 MPa (in case of a substantial amount of the particles being larger than 4 mm) and 200 MPa (in case of substantially all particles being smaller than 4 mm),

(3) a Moh's hardness (referring to the mineral constituting the particles) exceeding 7 and

(4) a Knoop indentor hardness (referring to the mineral constituting the particles) exceeding 800, said particles having a size of 100μ–0.1 m, and optionally

(D) additional bodies which have at least one dimension which is at least one order of magnitude larger than the particles A,

whereby, when the shaped article is not selected from the group consisting of in situ cast oil well walls; duct fillings; fissure fillings; sheets; panels and tiles of thin-walled plane or corrugated shape; anti-corrosion protecting covers applied on steel and concrete members; pipes; tubes; electrically insulating members; nuclear shieldings; seafloor structures for deep water application; brake linings; abrasion aggregates; machine parts; sculptures; and containers; the following provisos apply:

(1) when additional bodies D are not present or are present and consist of sand and/or stone, at least 20% by weight of the particles B are Portland cement, and further

(2) when the particles B do not have a molecular structure different from the molecular structure of the particles A, the shaped article is selected from the group consisting of articles produced by shaping in a low stress field of less than 5 kg/cm^2, preferably less than 100 g/cm^2, articles having at least one dimension of at least one meter and having a minimum cross section of at least 0.1 m^2, and articles having a complex shape that does not permit its establishment by powder compaction.

4,588,444

METHOD FOR CLEANING POLYMERIC CONTACT LENSES

Ronald L. Anderson, 7199 Sunbury Rd., Westerville, Ohio 43081

Filed Apr. 4, 1984, Ser. No. 596,796

Int. Cl.[4] B08B *3/08*

U.S. Cl. 134—2 **11 Claims**

1. A process for removing calcium containing mucin lipid proteins from polymeric contact lenses which comprises rubbing said lenses with a finely divided crystalling powder; essentially all of said powder passing through a 50 mesh screen (U.S. Standard) with at least about 80 weight % of said powder being retained on a 200 mesh screen (U.S. Standard); said powder consisting essentially entirely of sodium chloride, or sodium bicarbonate, or a binary mixture of sodium chloride and sodium bicarbonate; said powder being essentially entirely free of iodide and other ions which irritate the human eye when in contact with a polymeric contact lens.

4,588,445

ELIMINATING DRILLING MUD SOLIDS FROM SURFACE WELL EQUIPMENT

John E. Oliver, 3752 Del Monte, Houston, Tex. 77019, and Arnold M. Singer, 3042 Las Palmas, Houston, Tex. 77027

Continuation-in-part of Ser. No. 450,519, Dec. 17, 1982, Pat. No. 4,515,699, and Ser. No. 420,140, Sep. 20, 1982, Pat. No. 4,453,598. This application Jul. 24, 1984, Ser. No. 633,797

The portion of the term of this patent subsequent to Jun. 12, 2001, has been disclaimed.

Int. Cl.[4] B08B *9/00;* **E21B** *21/00;* **134** *8, 22.14, 22.19, 26, 40;* **166** *312;* **252** *8.55 B*

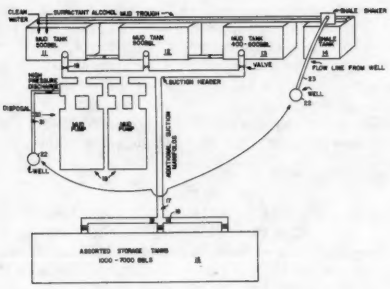
U.S. Cl. 134—22.14 **8 Claims**

1. A process for eliminating drilling mud and other solids

and oil from surface equipment of a well system which is to receive solids-free completion and packer fluids having an affinity to entrain residual solids, the steps comprising:

(a) mechanically removing the drilling mud and other solids from the surface equipment and washing said surface equipment with relatively solids-free water to displace these solids from the surface equipment to a convenient disposal area or vessel;

(b) introducing clean water into the surface equipment and adding to the clean water surfactant and alcohol of at least 5



carbon atoms to produce a treated water and circulating the treated water of the Newtonian type at turbulent flowing conditions through all surface equipment receiving the solids-free completion and packer fluids whereby substantially all residual solids are suspended in said treated water; and

(c) circulating clean water through said surface equipment to remove said treated water and entrained solids from said surface eqipment to a disposal area or vessel until the surface equipment is sufficiently free of solids to avoid contamination of completion and packer fluids introduced into the surface equipment.

4,588,446

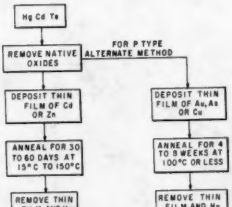
METHOD FOR PRODUCING GRADED BAND GAP MERCURY CADMIUM TELLURIDE

John H. Tregilgas, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 21, 1985, Ser. No. 703,799

Int. Cl.[4] H01L *21/385*

U.S. Cl. 148—1.5 **8 Claims**


Hg Cd Te
REMOVE NATIVE OXIDES
FOR P TYPE ALTERNATE METHOD
DEPOSIT THIN FILM OF Cd OR Zn
DEPOSIT THIN FILM OF Au, As OR Cu
ANNEAL FOR 30 TO 60 DAYS AT 15°C TO 150°C
ANNEAL FOR 4 TO 9 WEEKS AT 100°C OR LESS
REMOVE THIN FILM AND Hg THEREIN
REMOVE THIN FILM AND Hg THEREIN

1. A method of providing substrates of mercury cadmium telluride with graded bandgap at the surface region thereof, comprising the steps of:

(a) providing a substrate of mercury cadmium telluride,

(b) depositing a thin film of a material taken from the class consisting of cadmium and zinc on a surface of said substrate,

(c) annealling said substrate with the film thereon for a period sufficient to cause a predetermined amount of mercury to travel from said substrate into said film, and

(d) removing the thin film with the mercury therein.

5. A method of providing substrates of mercury cadmium telluride with graded band gap at the surface region thereof, comprising the steps of:

(a) providing a P-type substrate of mercury cadmium telluride,

(b) depositing a thin film of a material taken from the class consisting of gold, silver and copper on a surface of said substrate,

(c) annealling said substrate with the film thereon for a period sufficient to cause a predetermined amount of mercury to travel from said substrate into said film, and

(d) removing the thin film with the mercury therein.

4,588,447

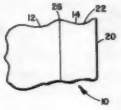
METHOD OF ELIMINATING P-TYPE ELECTRICAL ACTIVITY AND INCREASING CHANNEL MOBILITY OF SI-IMPLANTED AND RECRYSTALLIZED SOS FILMS

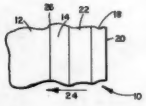
Ilan Golecki, Fullerton, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 25, 1984, Ser. No. 624,076

Int. Cl.[4] H01L *21/225, 21/263*

U.S. Cl. 148—1.5 **12 Claims**





1. A method for producing a silicon film on a sapphire substrate comprising:

depositing a thin film of silicon on said sapphire substrate, said silicon film having an outward surface;

implanting ions into said silicon film to substantially amorphize said silicon film, excepting for a thin seed layer adjacent said outward surface of said silicon film;

recrystallizing the amorphous portion of said silicon film;

oxidizing said seed layer for a time sufficient to permit a component of the oxidizing agent to diffuse through said silicon film and react with aluminum in said film to render said aluminum electrically inactive.

4,588,448

PROCESS FOR SEALING ANODICALLY OXIDIZED ALUMINIUM OR ALUMINIUM ALLOY SURFACES

Hans-Peter Baumann, Ettingen; Carl T. Speiser, Muttenz, and Ernst Weisskopf, Birsfelden, all of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Continuation of Ser. No. 409,110, Aug. 18, 1982, abandoned. This application Nov. 8, 1984, Ser. No. 669,818

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1981, 3134127

Int. Cl.[4] C23C *22/66*

U.S. Cl. 148—6.27 **23 Claims**

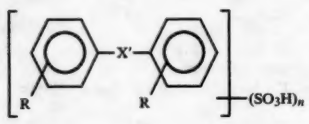
1. In a process wherein an oxidized aluminum ior aluminum alloy surface is sealed by applying thereto an aqueous solution containing an effective amount of an agent to hinder formation of a smut layer on said surface, the improvement wherein said agent comprises a reaction product of

(A) one or more sulphonated aromatic compounds selected from compounds of formula I, compounds of formula II,

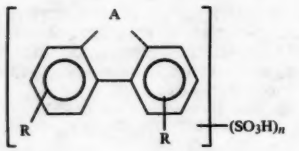
unsubstituted sulphonated phenols and sulphonated phenols substituted by one or two C_{1-4}alkyl groups, with

(B) an aldehyde, dimethylolurea, a mixture of an aldehyde and dimethylolurea, a mixture an aldehyde, formaldehyde and urea or a mixture of formaldehyde and urea,

with the proviso that when (A) is a substituted or unsubstituted phenol (B) is dimethylolurea or a mixture of formaldeyde and urea; said formulae I and II being as follows:



(I)



(II)

in which

X' is a direct bond, or —O—,

A is —O— or —S—,

each R, independently, is hydrogen or C_{1-4}alkyl,

and n may be a non-integral average number and is 1 to 4.

4,588,449

OXIDE WHISKER GROWTH ON CONTAMINATED ALUMINUM-CONTAINING STAINLESS STEEL FOIL

David R. Sigler, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 3, 1984, Ser. No. 677,285

Int. Cl.[4] C23C *11/10, 11/11, 8/06*

U.S. Cl. 148—6.35 **6 Claims**

1. A method for forming an integral oxide layer characterized by multitudinous oxide whiskers on ferritic stainless steel foil initially being composed of an iron-base alloy containing chromium, aluminum, and magnesium, said magnesium being present as an impurity in an amount sufficient to inhibit formation of said whiskers, said method comprising

heating the foil at a temperature effective to selectively vaporize magnesium from the solid alloy while avoiding incipient melting of the alloy, said magnesium diffusing from interior regions of the foil to surfaces thereof and subliming into a suitable ambient phase, said magnesium vaporization continuing for a time sufficient to reduce the magnesium concentration in the alloy to below 0.002 weight percent, and oxidizing the foil to form the oxide whisker layer.

4,588,450

NITRIDING OF SUPER ALLOYS FOR ENHANCING PHYSICAL PROPERTIES

Ankur Purohit, Lisle, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 25, 1984, Ser. No. 624,085

Int. Cl.[4] C22F *1/10*

U.S. Cl. 148—20.3 **5 Claims**

1. A process of improving the high temperature physical properties of a super alloy having a thickness, containing at least about 67% of Cr and Ni, and having a melting temperature in the range of 1300°–1350° C.; comprising the step of exposing the alloy to an atmosphere of elemental nitrogen (N vs N_2) at elevated temperatures in excess of 750° C. but less than 1150° C. for a time sufficient to nitride at least some of the surface of the alloy and establish barrier nitrides for shielding the available oxidizing metallic species of the alloy, the barrier nitrides extending to a depth in the order of 25–100 micrometers but substantially less than the thickness of the alloy.

4,588,451

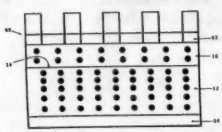
METAL ORGANIC CHEMICAL VAPOR DEPOSITION OF III-V COMPOUNDS ON SILICON

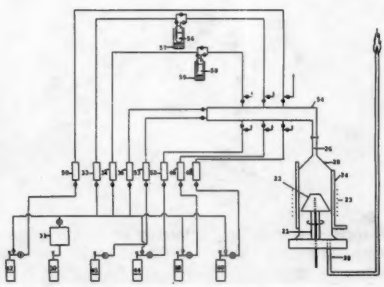
Stanley M. Vernon, Wellesley, Mass., assignor to Advanced Energy Fund Limited Partnership, Peterborough, N.H.

Filed Apr. 27, 1984, Ser. No. 604,835

Int. Cl.[4] H01L *21/205, 29/267*

U.S. Cl. 148—175 **12 Claims**





1. A method of forming a composite comprising single crystal silicon substrate and a single crystal film consisting of gal-

lium arsenide or gallium aluminum arsenide disposed on and in direct contact with said silicon substrate, said method comprising steps of:

heating said substrate in a hydrogen swept reactor vessel;

introducing into said hydrogen swept reactor vessel a mixture in the gas phase of arsine and an organometallic compound of gallium, aluminum or mixtures thereof;

preconditioning the silicon surface by inducing an initial transient in the arsine-to-gallium or arsine-to-gallium-plus-aluminum ratio, as the case may be, said transient being from an instantaneous ratio value significantly lower than 5:1 up to the ratio value used for continued growth; and,

epitaxially depositing on said preconditioned silicon surface a single crystal film of gallium arsenide or gallium aluminum arsenide

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4,588,452

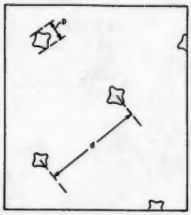
AMORPHOUS ALLOYS FOR ELECTROMAGNETIC DEVICES

Davidson M. Nathasingh, Stanhope; Amitava Datta, Morris Township, Morris County; Ronald J. J. Martis, Madison, and Nicholas J. DeCristofaro, Chatham, all of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Division of Ser. No. 475,782, Mar. 16, 1983, Pat. No. 4,473,413. This application Jun. 18, 1984, Ser. No. 621,753

Int. Cl.[4] C21D *1/04*

U.S. Cl. 148—108 **7 Claims**



1. A process for enhancing magnetic properties of an alloy composed of a composition having the formula $Fe_aB_bSi_cC_d$ and Cr_e wherein "a", "b", "c", "d" and "e" are atomic percentages ranging from about 75 to 83, 15 to 17, 4.5 to 5.5, 0.1 to 0.75 and 1 to 3, respectively, with the proviso that the sum of "a", "b", "c", "d" and "e" equals 100, which process comprises the steps of (a) quenching a melt of the alloy at a rate of at least about 10^5°C./sec to form said alloy into continuous ribbon coated with a chromium oxide insulating layer; and (b) annealing said coated ribbon at a temperature and for a time sufficient to induce precipitation of discrete particles in the amorphous metal matrix thereof.

4,588,453

METHOD OF MANUFACTURING GRAIN-ORIENTED SILICON STEEL SHEETS

Yoh Shimizu, and Teruyuki Nishide, both of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

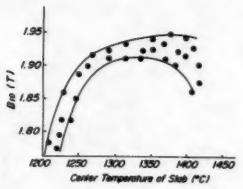
Filed Jan. 3, 1985, Ser. No. 688,569

Claims priority, application Japan, Jan. 9, 1984, 59-728

Int. Cl.[4] H01F *1/04*

U.S. Cl. 148—111 **3 Claims**

1. In a method of manufacturing grain-oriented silicon steel sheets having an orientation of (110), which method includes heating a silicon steel slab containing 2.0 to 4.5% by weight of silicon, 0.02 to 0.10% by weight of manganese and 0.005 to 0.06% by weight in total of at least one element selected from sulfur, selenium and aluminum, hot rolling said heated slab to a thickness of 1.4–3.5 mm, and then cold rolling said hot rolled slab at one-step or two-step inclusive of an intermediate annealing to a finished thickness of 0.15–0.50 mm and thereafter subjecting said slab to a decarburization annealing and a subsequent high temperature box annealing, the improvement which comprises carrying out the heating of said silicon steel slab in such manner that said slab is heated in a slab heating furnace of a gas firing type until a center temperature of said slab reaches to 900°–1,230° C., placing said slab in a slab induction heating



furnace before the center temperature of said slab is less than 900° C. and then heating said slab in an inert gas atmosphere, so as to hold the center temperature of said slab at 1,250°–1,380° C. for not less than 10 minutes, during which an amount of oxygen gas in said atmosphere, when a surface temperature of said slab is not less than 1,250° C., is limited to not more than 1%.

4,588,454

DIFFUSION OF DOPANT INTO A SEMICONDUCTOR WAFER

Wadie N. Khadder, and Jia-Tarng Wang, both of Sunnyvale, Calif., assignors to Linear Technology Corporation, Milpitas, Calif.

Filed Dec. 21, 1984, Ser. No. 684,758

Int. Cl.[4] H01L *21/385*

U.S. Cl. 148—188 **6 Claims**

1. A method for doping silicon wafers with a dopant selected from the group consisting of boron, phosphorus, arsenic and antimony comprising:

a deposition phase comprising the step of depositing a layer consisting essentially of a large quantity of glass formation of a selected dopant on said silicon wafers at a first temperature within a defined temperature range, so that said large quantity of glass formation is formed on said wafers at a relatively high rate in a short period of time;

an incorporation phase comprising the step of controllably raising said first temperature to a relatively higher temperature and maintaining said higher temperature for a specified period so that a specified amount of dopant is incorporated into said wafers; and

etching excess glass formation from said wafers.

4,588,455

PLANAR DIFFUSION SOURCE

Milton Genser, Short Hills, N.J., assignor to Emulsitone Company, Whippany, N.J.

Filed Aug. 15, 1984, Ser. No. 641,715

Int. Cl.[4] H01L *21/223*

U.S. Cl. 148—189 **11 Claims**

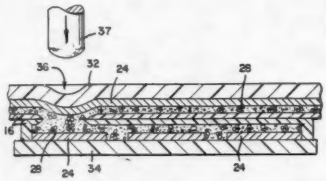
1. A method for effecting the doping of semi-conductor materials comprising coating an inert solid substrate with a solid layer of a composition including an inorganic salt of the dopant element, placing said coated substrate in close proximity to a semi-conductor material to be doped, heating both said coated substrate and semi-conductor material to a temperature sufficiently high to volatilize the dopant element, whereby said dopant migrates to said semi-conductor material and diffuses into said semi-conductor material.

4,588,456

METHOD OF MAKING ADHESIVE ELECTRICAL INTERCONNECTING MEANS

Ronald A. Dery, and Warren C. Jones, both of Winston-Salem, N.C., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 4, 1984, Ser. No. 657,717
Int. Cl.[4] H01B *13/06*
U.S. Cl. 156—52 **10 Claims**



1. A method of connecting at least one conductive path means of a first insulating member with at least one conductive means on a second insulating member comprising the steps of:

selecting the first insulating member having at least one conductive path means on at least one surface thereof;

applying a dielectric adhesive means covering said first insulating member and said conductive path means, said dielectric adhesive means having conductive particles of random size randomly dispersed throughout, said particles being spaced apart so that no electrical connection takes place on the surface of said insulating member;

applying an insulating thermoplastic adhesive layer secured onto said first insulating member covering said at least one conductive path means;

positioning said at least one conductive path means in a conducting relationship with said at least one conductive means on said second insulating member such that said thermoplastic adhesive layer is disposed between said at least one conductive path means and said at least one conductive means;

applying heat and pressure to the positioned at least one conductive path and at least one conductive means causing said insulating thermoplastic adhesive layer to soften, flow and become thinner thus causing said large conductive particles on said at least one conductive path to extend through said insulating layer and make electrical connection with said at least one conductive means.

4,588,457

TWO-PLY NONWOVEN FABRIC LAMINATE

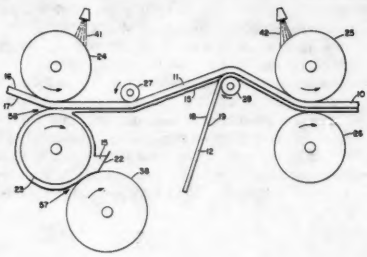
Susan L. H. Crenshaw, Memphis, Tenn.; Neal L. Schlintz, Newcastle upon Tyne, England, and Danny R. Moore, Germantown, Tenn., assignors to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 474,417, Mar. 11, 1983. This application Aug. 2, 1985, Ser. No. 762,095
Int. Cl.[4] B29J *5/00*
U.S. Cl. 156—62.8 **22 Claims**

1. A process for making a two-ply nonwoven fabric laminate having a first ply of synthetic fibrous nonwoven material having an outer surface, an inner surface, and a thickness and a second ply of fibrous nonwoven material having an outer surface, an inner surface, and a thickness comprising:

(a) coating said inner surface(s) of at least one of said first and second plies with a substantially continuous layer of an aqueous emulsion of a flexible, soft latex binder, said emulsion having a solids content of from about 45% to about 80% and a viscosity of from about 8,000 cp to about 25,000 cp, said latex binder having a glass transition temperature of from about 0° C. to about −80° C.;

(b) forming said two-ply laminate by adhering said inner surfaces of said first ply and said second ply together under pressure, whereby said emulsion penetrates from said inner surface of said first ply to a depth of from about 20% to about 80% of said thickness of said first ply, and said emulsion penetrates from said inner surface of said



second ply to a depth of from about 20% to about 80% of said thickness of said second ply; and

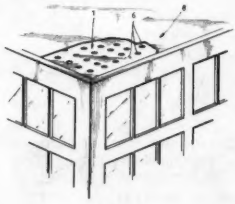
(c) drying said emulsion.

4,588,458

SINGLE PLY ROOFING BASE SHEET ADHERENCE METHOD

Mario Previsani, Vascigliano di Stroncone, Italy, assignor to U.S. Intec, Inc., Port Arthur, Tex.

Filed Oct. 26, 1984, Ser. No. 665,020
Int. Cl.[4] E04B *2/00*
U.S. Cl. 156—71 **7 Claims**



1. A method of waterproofing a roofing substrate comprising:

(a) covering a substrate with a perforated underlayment comprising a reinforcing fibrous material impregnated with a bitumen/polymer mixture, said perforations being about 10 mm to about 150 mm in diameter, and the composite cross-sectioned area of said perforations comprising no greater than about 25% of the total surface area of one side of the underlayment membrane;

(b) heating the underside of a waterproofing overlayment membrane which comprises a reinforcing fibrous material impregnated with a substantially similar bitumen/polymer mixture as said bitumen/polymer mixture of said underlayment membrane, said heating being sufficient to cause said bitumen/polymer mixture to exceed its softening point and begin to flow; and

(c) covering said underlayment membrane with said overlayment waterproofing membrane soon enough after heating to cause in part said bitumen/polymer mixture of said overlayment to fuse to said bitumen/polymer mixture of said underlayment and in part to allow said bitumen/-polymer mixture of said overlayment to pass through said perforations and adhere to said substrate.

4,588,459

METHOD OF MAKING A PIPE CLUSTER UNIT

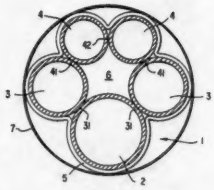
Hermann Zwilling, Rehau, Fed. Rep. of Germany, assignor to Rehau Plastiks AG & Co., Rehau, Fed. Rep. of Germany

Filed Mar. 9, 1984, Ser. No. 587,767

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1983, 3308482

Int. Cl.[4] B32B *31/12, 31/26*

U.S. Cl. 156—85 8 Claims



1. A method of making a pipe cluster unit, comprising the following steps:

(a) forming a pipe cluster of a plurality of plastic pipes such that adjoining pipes are in engagement with one another along a longitudinal line of contact;

(b) subjecting external pipe surface portions spaced from respective longitudinal lines of contact to a bond enhancing treatment comprising heating said surface portions;

(c) subsequent to step (b), applying a heated cover layer to surface portions treated in step (b), whereby a bond between the cover layer and the surface portions is effected; said cover layer bridging adjoining pipes at a location spaced from the respective longitudinal lines of contact; and

(d) immediately subsequent to step (c), cooling the cover layer to effect shrinkage thereof.

4,588,460

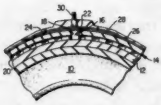
METHOD AND APPARATUS FOR RECAPPING A TIRE WITH A FLEXIBLE SEGMENTED MOLD

Arthur W. Magee, Richardson; Richard D. Shockley, Dallas, and Michael E. Crawford, Irving, all of Tex., assignors to Long Mile Rubber Co., Inc., Dallas, Tex.

Filed Apr. 18, 1984, Ser. No. 601,543

Int. Cl.[4] B29D *30/58*

U.S. Cl. 156—96 16 Claims



1. A method for recapping tires utilizing uncured rubbed and a prepared tire carcass, comprising:

building up the prepared tire carcass with a layer of the uncured rubber;

disposing the negative contour of a tread pattern of a non-sticking, heat resistant elastomeric, segmented mold adjacent the uncured rubber layer, the segmented mold having at least two free ends such that the segmented mold can be opened for disposal about the prepared tire carcass;

separating the ends of the segmented mold by a predetermined gap prior to curing;

applying external pressure to the segmented mold directed radially inward in order to maintain the position of the mold on the tire carcass; and

curing the layer of rubber to form the positive contour of the tread pattern therein, said gap between the ends of the segmented mold closing during curing to prevent rubber from being forced upward into the gap and to prevent the mold from being pushed radially outward from the tire carcass.

4,588,461

PROCESS FOR PRODUCING A VESSEL PROSTHESIS

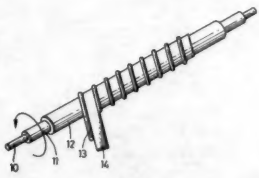
Bernd Braun, Melsungen, Fed. Rep. of Germany, assignor to Intermedient GmbH, Emmenbrucke, Switzerland

Filed Dec. 13, 1984, Ser. No. 681,101

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1983, 3345513

Int. Cl.[4] B65H *81/00*

U.S. Cl. 156—143 11 Claims



1. A method for producing a vessel prosthesis that is resistant to bending and possesses a smooth interior, which comprises the following steps:

(a) covering a mandrel with a cylindrical hose having a smooth interior;

(b) winding at least one reinforcing thread and a band-shaped spacer around said hose with individual windings of said thread separated by windings of said band-shaped spacer so that said thread rests loosely but stably on said hose with said interior of said hose remaining smooth; then,

(c) bonding said thread to said cylindrical hose so that said interior of said hose remains smooth; then,

(d) removing said band-shaped spacer; and then,

(e) removing said cylindrical hose with said thread bonded thereto from said mandrel.

4,588,462

METHOD AND APPARATUS FOR LAYING WIRE ARRAYS

Seymour M. Horowitz, 6525 Swainland Dr., Oakland, Calif. 94611, and Dale D. Nesbitt, 1712 Marin Ave., Berkeley, Calif. 94707

Filed Feb. 28, 1985, Ser. No. 706,967

Int. Cl.[4] B65H *81/00*

U.S. Cl. 156—177 22 Claims

1. In a method of forming a wire array in which wire is adhered to a surface of a substrate material in a predetermined pattern thereon, the steps comprising:

disposing adhesive on said surface at least along each of two opposite edge portions thereof,

positioning a first plurality of removable winding spools along a first of said edge portions of said surface in spaced apart relationship therealong and positioning a second

plurality of removable winding spools along the second of said edge portions of said surface in spaced apart relationship therealong,

winding a continuous wire around said spools in a configuration wherein successive portions of said wire extend between spools at opposite edges of said surface in spaced apart relationship from said surface,

traveling said wire along said spools towards said surface and into contact with said adhesive,

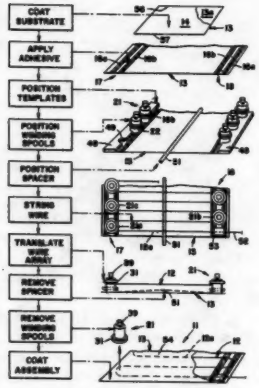
removing said winding spools from said surface of said substrate, and

applying a coating of hardenable material to said surface of said substrate.

11. A method of fabricating a wire array which has a continuous wire formed into a predetermined pattern that is secured to a surface of a backing material comprising the steps of:

applying adhesive material to said surface at least at each of first and second spaced apart portions thereof,

disposing a row of spaced apart winding spools at each of said spaced apart portions of said surface including utilizing a template to establish predetermined positions for each of said spools on said surface,



disposing a spacer element on said surface between said first and second portions thereof,

winding said wire around each of said spools including extending successive portions of said wire between spools at said first and second spaced apart portions of said surface while initially maintaining said wire spaced apart from said surface,

traveling said wire along said spools towards said surface and into contact with said adhesive material to adhere the portions of said wire adjacent said spools to said surface and to bring other portions of said wire into contact with said spacer element, including relaxing tension in said wire as it approaches said adhesive material,

removing said spools from said surface and withdrawing said spacer element from between said wire and said surface to introduce slack into said wire, and

applying a coating of a hardenable material to said surface including said wire to secure said wire thereto in said predetermined pattern thereon.

4,588,463

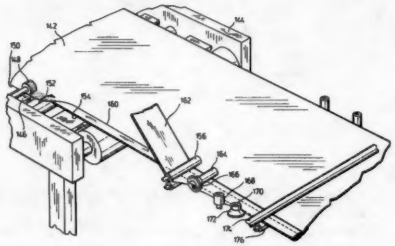
METHOD OF PRODUCING A REINFORCED FILE FOLDER

Donald T. Barber, Toronto, and Erhard P. Walter, Bramalea, both of Canada, assignors to Datafile Limited, Willowdale, Canada

Continuation-in-part of Ser. No. 439,280, Nov. 4, 1982. This application Jan. 10, 1984, Ser. No. 569,576

Int. Cl.[4] B31F *5/08*

U.S. Cl. 156—200 **10 Claims**



1. A method for producing a reinforced edge of a file substrate of paper stock comprising

withdrawing paper folder web stock from a supply roll and advancing the web stock,

applying and bonding a continuous tear resistant plastic film to one surface of the web stock adjacent one straight edge thereof as it is advanced,

folding the web stock and film in the length of the film as the web stock is advanced to produce two opposed paper stock portions with film to the exterior thereof,

applying an adhesive to said opposed paper stock portions which secures the same,

cutting within the width of the film to form a desired shape of the reinforced edge of the file substrate and cutting said web stock in predetermined lengths to form said file substrate.

4,588,464

METHOD OF PRODUCING A FLUOROCARBON FILTER ELEMENT

Tokuya Miyagi, Osaka; Akihisa Inoue, Hirakata; Katushi Hamada; Shoichi Fujimori, both of Neyagawa, and Yoshihiro Hori, Shimizu, all of Japan, assignors to Kurashiki Boseki Kabushiki Kaisha, Japan

Filed May 8, 1984, Ser. No. 608,309

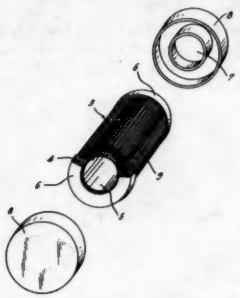
Claims priority, application Japan, Sep. 9, 1983, 58-167202

Int. Cl.[4] B29C *53/24, 53/38, 53/84*

U.S. Cl. 156—218 **8 Claims**

1. A method for producing a filter element made wholly of a fluorocarbon resin characterized by forming sheet comprising a filter membrane made of a fluorocarbon resin and net supporters made of thermoplastic fluorocarbon resin superimposed on the both surfaces thereof into a pleat form, bending the pleated sheet into a cylindrical form liquid-tightly welding the edge parts of the adjacent both sides, pre-welding the pleats by heating the both end parts of the cylindrical pleat-form filter to a temperature higher than the melting point of the net supporter, cooling the pre-welded filter, melting a thermoplastic fluorocarbon resin in a circular mold having means defining a central opening, inserting the end parts of the cooled pre-welded pleat into the molten thermoplastic fluorocarbon resin in the circular mold having a central opening to

force the resin into the pleats, whereby the end part and the molten resin are integrally welded together, and fitting fluoro-



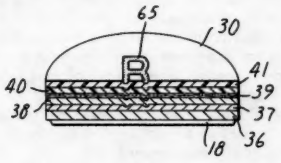
carbon resin caps having a prescribed shape in the ends parts of the resulting filter material.

4,588,465

METHOD FOR FORMING A SEALED CONTAINER

Walter J. Paciorek, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 4, 1983, Ser. No. 464,120
Int. Cl.⁴ B31F *1/00*; B32B *31/00*; B65D *55/02*; B29C *13/02*
U.S. Cl. 156—220 **5 Claims**



1. A process for imparting indicia onto a closure liner for a container cap during application of the liner to the container cap having a top comprising the steps of:

inserting a container cap into the liner inserting station of a lining machine,

inserting a small amount of adhesive into the cap against the top of the cap,

moving a closure liner laminate, comprising a layer of resilient material having a wax coating which coating contacts one surface of a layer of metal foil on an oposite surface of which is adhered a sealing layer suitable for sealing the laminate to a container, into said inserting station,

cutting from said laminate a section of said laminate to fit into said cap,

inserting the cut section of said laminate into said cap,

pressing said section against the top of said cap, and

imparting an embossed image into said laminate to define an embossed image in said metal foil.

4,588,466

TAPE LAYING METHOD AND APPARATUS

Homer L. Eaton, Leucadia, Calif., assignor to Vektronics Manufacturing, Inc., Carlsbad, Calif.

Continuation-in-part of Ser. No. 483,293, Apr. 8, 1983, Pat. No. 4,491,493. This application Jul. 8, 1983, Ser. No. 512,406
Int. Cl.⁴ B44C *31/00*
U.S. Cl. 156—235 **37 Claims**

1. The method of laying composite tape between boundaries defining an area of a work surface that is to be covered with a plurality of strips of tape comprising

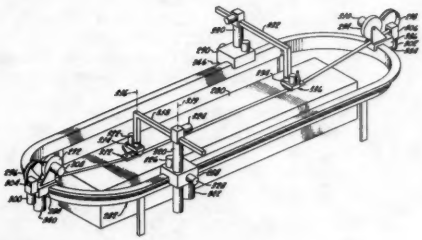
stretching a strip of tape between a first boundary and a second boundary adjacent said work surface with one end of said strip at said first boundary,

pressing said strip against said surface at a pressure area of said tape strip,

moving said pressure area along said tape strip across said work surface area while holding said tape strip stretched across and adjacent said work surface area, said tape being mounted on a carrier belt and wound on a supply reel mechanism,

mounting the supply reel mechanism and a belt take-up mechanism beyond said first and second boundaries, said steps of pressing said strips comprising mounting a tape pressure head adjacent said work surface, and

moving said supply and take-up mechanisms independently of said pressure head around the boundaries of said work surface area to define tape paths between the mechanisms that extend at all orientations across the work surface so that the carrier belt and a tape strip may be stretched between the mechanisms across said work surface area in any orientation.



8. Apparatus for laying tape comprising

a work table,

first, second, and third carriages mounted adjacent said work table,

a supply reel receiver mounted on said first carriage and adapted to carry a reel of tape mounted upon a carrier belt,

a take-up mechanism mounted on said second carriage and adapted to receive a carrier belt withdrawn from a supply reel on said supply reel receiver,

said first and third carriages being mounted for mutually independent motion along said work table,

a pressure head mounted on said third carriage, said head including means for pressing said tape against said work table, and

means for driving said third carriage and said pressure head toward said first carriage and said supply reel receiver while pressing said tape against the work table.

4,588,467

STATOR FOR ROTATING ELECTRIC MACHINE

Naoki Tani, and Kazuyuki Aiba, both of Nagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

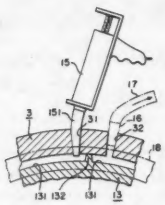
Filed Sep. 6, 1984, Ser. No. 647,642
Claims priority, application Japan, Nov. 7, 1983, 58-209423
Int. Cl.⁴ B32B *31/00*
U.S. Cl. 156—294 **3 Claims**

1. A method of securing a stator body of a rotating electric machine to stator supporting members in a rotating electric machine frame through stator clampers by using an adhesive, which comprises:

forming an annular groove in at least one of an inner circumferentially surface of said stator supporting members and an outer circumferential surface of said stator clampers;

forming inlet and outlet ports for an adhesive in said stator supporting members or said stator clampers to communicate with said annular groove;

filling said annular groove in a single radial direction with said adhesive under pressure via said inlet port; and



blocking flow of said adhesive upstream of said outlet port so as to cause said overflowing of said adhesive from said outlet port.

4,588,468

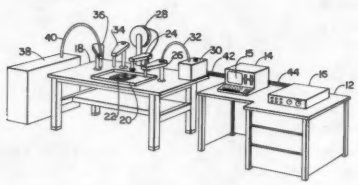
APPARATUS FOR CHANGING AND REPAIRING PRINTED CIRCUIT BOARDS

Joseph R. McGinty, Healdsburg, Calif., and Kevin A. Donnelly, Huntsville, Ala., assignors to Avco Corporation, Huntsville, Ala.

Filed Mar. 28, 1985, Ser. No. 717,202

Int. Cl.[4] B44C *1/22*; B32B *31/00*; C23F *1/02*; B29C *17/08*

U.S. Cl. 156—345 **7 Claims**



1. Apparatus for changing and repairing printed circuit boards having a plurality of foil strip conductors etched thereon, the plurality of conductors being conformal coated for protection, each conductor terminating at a pad capable of receiving electronic circuit components, the apparatus comprising:

work station means including an X-Y positioning fixture for mounting and retaining a printed circuit board, motion of said positioning fixture being relative to said work station means thereby providing indexing of a point on the surface of said printed circuit boards;

cutting means for making cuts in said foil strip conductors at predetermined locations;

laser beam discharge means for removing solder masks and conformal coatings from the foil strip conductors of said printed circuit board at predetermined points;

wire dispensing means for forming and mechanically bonding jumper wires between a plurality of first and second connection points on said printed circuit board;

wire insulation removal means at locations where jumper wires cross over connection points;

solder means for electrically encircuiting said jumper wires with the foil strip conductors of said printed circuit board;

a computer including a memory, said computer having means for generating commands in accordance with programmed instructions for actuating, sequencing and directing said complement of work station, cutting, laser beam discharge, wire dispensing, wire insulation removal and solder means for accomplishing electric circuit modification of said printed circuit board; and

a control console coupled to said computer for inserting programmed instructions therein.

4,588,469

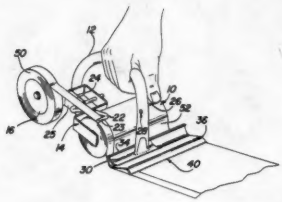
MASKING PAPER AND TAPE DISPENSER

Travis L. Hunter, Upland, Calif., assignor to PC Manufacturing Corp., Phoenix, Ariz.

Continuation of Ser. No. 546,362, Oct. 27, 1983, Pat. No. 4,508,587. This application Feb. 20, 1985, Ser. No. 703,683

Int. Cl.[4] B32B *31/08*

U.S. Cl. 156—527 **8 Claims**



1. A masking paper and tape dispensing machine comprising:

a. an elongate curved frame member including

i. a first end,

ii. a second end, and

iii. a central hand grip comprised of an integral portion of said curved frame intermediate said first and second ends;

b. a roller mounting bracket carried proximate one of the ends of said frame member;

c. a paper roller drum carried by said mounting bracket for rotation about an axis of rotation;

d. a tape roller drum carried by said mounting bracket for rotation about an axis of rotation, said tape roller drum being positioned such that the dispensing path of a roll of tape mounted upon said tape roller drum is generally aligned with one end of said paper roller drum;

e. a blade mounting bracket carried proximate the other of the ends of said frame member; and

f. a blade carried by said blade mounting bracket and having a cutting edge.

4,588,470

APPARATUS FOR APPLYING ADHESIVE TO STACKED SHEETS IN BOOKBINDING MACHINES

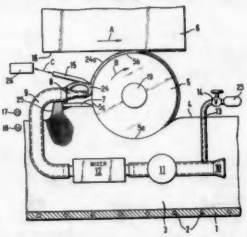
Heinz Abegglen, Frauenfeld, Switzerland, assignor to Grapha-Holding AG, Hergiswil, Switzerland

Filed Nov. 15, 1984, Ser. No. 672,105

Claims priority, application Switzerland, Nov. 22, 1983, 6261/83

Int. Cl.[4] B32B *5/18*

U.S. Cl. 156—578 **19 Claims**



1. Apparatus for applying layers of adhesive to selected regions of successive commodities of a series of commodities, particularly to edge faces of stacks of paper sheets in bookbinding machines, comprising means for transporting successive

commodities along a predetermined path; an adhesive-containing vessel adjacent a portion of and below said path; a substantially wheel-shaped applicator having a peripheral surface including an upper portion arranged to apply layers of adhesive to the commodities in said path and a second portion above the upper level of adhesive in said vessel; means for rotating said applicator in a direction such that said upper portion is located downstream of said second portion, as considered in said direction; a spray nozzle adjacent to said second portion; a source of gaseous fluid; means for respectively supplying to said nozzle fluid from said source and adhesive from said vessel; and means for mixing the supplied fluid and adhesive ahead of said nozzle without appreciable dissolution of fluid in the adhesive so that the latter sprays a homogeneous foamy mixture of such fluid and adhesive onto the second portion of said surface.

4,588,471

PROCESS FOR ETCHING COMPOSITE CHROME LAYERS

Jonathan H. Griffith, Poughkeepsie; Everton H. Henriques, Highland; James L. Kehoe, III, Salisbury Mills, and Marshall J. Suskie, Saugerties, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 25, 1985, Ser. No. 715,253
Int. Cl.[4] C23F *1/02*
U.S. Cl. 156—652 **24 Claims**

1. A method of etching a top and bottom chrome layer of a chrome-copper-chrome conductor array deposited on a glass plate comprising:

applying a layer of photoresist containing the desired conductor pattern on the surface of said chrome-copper-chrome layers,

contacting the upper chrome layer with an acidic aqueous etchant composition containing water, an inorganic acid, and at least one thiourea compound selected from the group of thiourea, substituted thiourea, and mixtures thereof, and rinsing off the acidic etchant,

contacting the exposed copper layer with an acid etch to strip the surface of said copper to conform to said conductor pattern, and rinsing off the acid etch, and

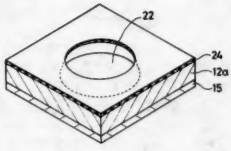
contacting the lower chrome surface with the same acidic etchant as said upper surface, and rinsing off the acidic etchant.

4,588,472

METHOD OF FABRICATING A SEMICONDUCTOR DEVICE

Isao Shimizu, Tamamura, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 26, 1984, Ser. No. 574,085
Claims priority, application Japan, Jan. 26, 1983, 58-9800
Int. Cl.[4] H01L *21/306;* B44C *1/22;* C03C *15/00, 25/06*
U.S. Cl. 156—628 **12 Claims**



1. A method of fabricating a piezoresistive semiconductor pressure sensor having a predetermined diaphragm configuration, comprising the steps of:

forming a highly doped region, in a single crystal semiconductor substrate with first and second principal planes facing each other, by covering at least part of said first principal plane by a mask for defining said predetermined diaphragm configuration, said mask having substantially the same configuration as said predetermined diaphragm configuration, and selectively introducing impurities into the portion thereof which is not covered by said mask;

forming an epitaxial semiconductor region on said second principal plane;

forming semiconductor regions for gauge resistors by selectively introducing impurities into the principal plane of the epitaxial semiconductor region positioned on a portion in which said highly doped region is not formed; and

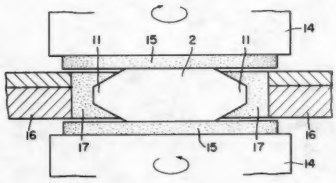
etching a portion of said first principal plane in which said highly doped region is not formed, to thereby form said predetermined diaphragm configuration, whereby a controlled recess providing the predetermined diaphragm configuration, independent of the crystal orientation of the semiconductor substrate, is formed.

4,588,473

SEMICONDUCTOR WAFER PROCESS

Kiyoshi Hisatomi, and Masaburo Iwabuchi, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 27, 1983, Ser. No. 536,263
Claims priority, application Japan, Sep. 28, 1982, 57-169105
Int. Cl.[4] H01L *21/306;* B44C *1/22*
U.S. Cl. 156—645 **5 Claims**



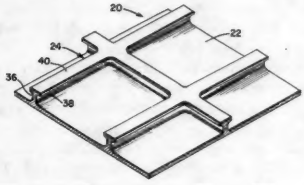
1. A process for producing semiconductor wafers which comprises transversely cutting off thin slices from a single-crystal semiconductor rod thereby to obtain wafers, bevel machining the edge part of each wafer, chemically machining the entire surface of the wafer, and polishing the beveled edge part to a mirror finish.

4,588,474

CHEMICAL MILLING PROCESSES AND ETCHANTS THEREFOR

Donald W. Gross, San Diego, Calif., assignor to Chem-tronics, Incorporated, El Cajon, Calif.

Continuation of Ser. No. 231,173, Feb. 3, 1981, abandoned. This application May 1, 1984, Ser. No. 605,830
Int. Cl.[4] C23F *1/02;* B44C *1/22;* C03C *15/00, 25/06*
U.S. Cl. 156—659.1 **30 Claims**



11. A method of chemically milling an aluminum or aluminum alloy workpiece to impart a selected shape thereto which comprises the steps of: cleaning said workpiece and masking any portions thereof in which the removal of metal is not wanted and thereafter immersing the workpiece for an ex-

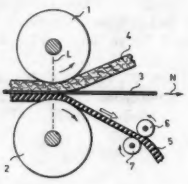
tended period of time in a chemical milling solution consisting of an alkali metal hydroxide or ammonium hydroxide, an alkali metal nitrate or ammonium nitrate, and water, there being from 80 to 120 grams of hydroxide and from 42 to 65 grams of nitrate calculated as the sodium salts per liter of solution.

4,588,475

METHOD AND DEVICE FOR REDUCING THE REWETTING OF WEB MATERIAL AFTER A PRESS NIP

Kristian Lundström, Soljala, Finland, assignor to Tamfelt Oy AB, Finland

Filed Sep. 20, 1984, Ser. No. 652,818
Claims priority, application Finland, Oct. 3, 1983, 833582
Int. Cl.[4] D21F *3/02*
U.S. Cl. 162—205 6 Claims



1. A method for reducing the rewetting of a web after a press nip, comprising:

passing the web to be dried together with a press felt though the press nip formed by a first pair of press rolls, said press nip having a center line defined between the center of each press roll,

separating said web and said felt from each other after the nip,

passing a mat of predetermined thickness made of a water-impermeable and resilient material through the press nip, said mat being in contact with the surface of either press roll and one of the surfaces of the web, said mat being compressed during passage through the press nip,

separating said mat and said web from each other after the nip,

subjecting the mat only to a tensile stress after the press nip for preventing the return of the mat to its original predetermined thickness starting immediately after the center line of the press nip and extending for a predetermined distance.

4. A device for reducing the rewetting of a web after the web is passed through a press nip comprising:

a first pair of press rolls forming a press nip, said press nip having a center line defined between the center of each press roll;

a press felt passing through said press nip together with said web, said web and said felt being separated from each other after the press nip;

a mat of predetermined thickness made of a water-impermeable and resilient material passing through said press nip, said mat being in contact with the surface of either press roll and one of the surfaces of the web, said mat being compressed during passage through the press nip and separated from said web after the press nip; and

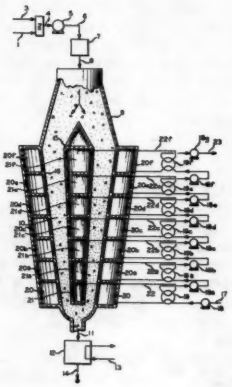
means for producing a tensile stress in the mat only, said tensile stress being produced after the mat passes through said press nip to prevent the mat from returning to its original predetermined thickness starting immediately after the center line of the press nip formed by the first pair of press rolls and extending for a predetermined distance.

4,588,476

SOLID LIQUID EXTRACTION APPARATUS

F. Morgan Warzel, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 282,769, Jul. 13, 1981, Pat. No. 4,376,693.
This application Sep. 20, 1982, Ser. No. 420,434
Int. Cl.[4] B01D *11/02*
U.S. Cl. 196—14.52 10 Claims



1. Apparatus for extracting soluble material from particulate solids composed of soild particles and said soluble material said apparatus comprising

(a) a housing composed of walls enclosing a flow path between an upstream end and a downstream end, said path comprising a series of connected replacement zones,

(b) at least portions of each of said replacement zones containing an inlet filter means connecting said replacement zone to an inlet chamber and an outlet filter means connecting said replacement zone to an outlet chamber, said filter means comprising filtering material allowing fluid containing said soluble material to pass through but withholding said solid particles,

(c) a fluid inlet conduit connected with each inlet chamber,

(d) a fluid outlet conduit connected with each outlet chamber,

(e) a pump between each outlet conduit connected to an outlet chamber of one replacement zone and each inlet conduit connected to the inlet chamber of the replacement zone upstream of said one replacement zone,

(f) a fresh solvent feed conduit connected to the inlet chamber of the replacement zone at the downstream end of said flow path,

(g) a fluid withdrawal conduit connected to the outlet chamber of the replacement zone at the upstream end of said flow path.

4,588,477

TRAVELING FLUIDIZED BED DISTILLATION OF SCRAP TIRES AND RUBBER VULCANIZATE

Ikram W. Habib, 6982 Parma Park Blvd., Parma Heights, Ohio 44130

Filed May 11, 1984, Ser. No. 609,292
Int. Cl.[4] C10B *49/10, 57/02, 57/04*
U.S. Cl. 201—25 4 Claims

1. A process for disposal of waste rubber consisting essentially of the steps of:

(a) charging, into an elongated vertically disposed distillation pyrolysis column, waste rubber having a particle size less than 1" and inert aggregate material having a particle size in the range of from ¼" to 1.0",

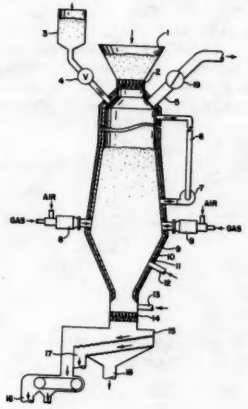
(b) passing said charge downwardly into a preheating zone

at a temperature of from 200°–400° C. to form a preheated charge wherein said rubber scrap is heated by the sensible heats of the aggregate material, and wherein volatile matter leaves the column; at the top thereof;

(c) moving said preheated charge downwardly into a heating and distillation zone in said column at a temperature of from 400° to 500° C. wherein said charge is heated by upwardly moving gases to a temperature sufficient to cause distillation of volatile materials and thermal decomposition of the scrap rubber

(d) moving said charge downwardly from said heating and distillation zone into a precombustion zone at a temperature of from 500° to 900° C. to pyrolyze the residual rubber remaining after step (c) above to a carbonaceous residue and yield a carbonaceous residue

(e) moving said charge downwardly from said precombustion zone into a combustion zone at a temperature of from 800° to 1,100° C. and introducing auxiliary gaseous fuel and air at a rate sufficient to fluidize the carbonaceous residue and any waste rubber particles present above said combustion zone and to provide sufficient heat energy



through combustion of at least a portion of the carbonaceous residue and any combustible gases produced in the zone below

(f) moving said charge downwardly from said combustion zone into a post-combustion zone at a temperature of 900°–1,100° C. and introducing air into said zone to sustain combustion of said carbonaceous residue to provide heat energy to said moving charge for the succeeding reduction zone;

(g) moving said charge downwardly into a reduction zone having a reducing atmosphere sufficient to reduce any zinc oxide from said scrap rubber to zinc metal, said reducing atmosphere being generated by introducing steam from the succeeding cooling zone;

(h) moving said charge downwardly into a cooling zone at 350° C. to 500° C. and introducing an aqueous cooling medium into said zone

(i) discharging hot aggregate material from said column

(j) segregating inert material from carbonaceous material; and

(k) recycling the segregated hot inert material for blending with fresh scrap rubber.

4,588,478

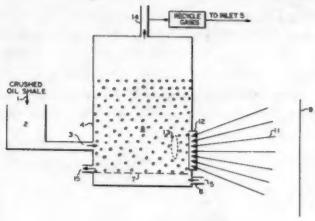
APPARATUS FOR SOLAR RETORTING OF OIL SHALE

F. Morgan Warzel, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 15, 1983, Ser. No. 532,433

Int. Cl.[4] C10B *1/04*

U.S. Cl. 202—99 3 Claims



1. An apparatus for solar retorting of oil shale, which comprises, in operable conjunction, means for bringing ground oil shale particles within the focal zone of at least one beam of solar radiation derived from a focusing mirror array means,

a shell, said shell defining therewithin a generally closed retort having a top portion, a bottom portion, and a side portion therebetween and having upper and lower side portions; transparent window means positioned in said lower side portion, inlet means positioned in said side portion and arranged for receiving oil shale particles, inlet means in said side portion and arranged for receiving fluidizing gases and positined below said oil shale particle inlet means, and means for admixing said oil shale particles and said fluidizing gases;

focusing array means arranged for receiving solar radiation positioned outside of said shell and arranged to collect and transmit solar radiation to said transparent window means to a focal zone just within said retort, said transparent window means positioned in said lower side portion of said shell and arranged to receive said solar radiation;

said retort defining a volume wherein contacting of said oil shale particles and said solar radiation occurs within said focal zone resulting in heating said particles, and a retorting volume wherein said heated particles are retorted to fines, shall oil, and product gases;

said apparatus defining a fluidized particle bed reactor means, said inlet means for oil shale particles and said inlet means for said fluidizing gases positioned in said lower side portion of said shell in operable conjunction with and below said inlet means for shale particles to provide fluidization of said particles by said fluidizing gases, whereby said oil shale particles are presented into said focal zone of said solar radiation in said lower side portion of said shell; and

means to remove said fines, gases, and shale oil from said retort.

4,588,479

DEVICE FOR COOLING INCANDESCENT COKE

Heinrich Weber, Recklinghausen; Kurt Lorenz, Hattingen, and Horst Dungs, Herne, all of Fed. Rep. of Germany, assignors to Firma Carl Still GmbH & Co. K.G., Fed. Rep. of Germany

Continuation-in-part of Ser. No. 366,176, Apr. 7, 1982, abandoned. This application Mar. 11, 1985, Ser. No. 710,031

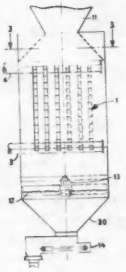
Claims priority, application Fed. Rep. of Germany, Apr. 16, 1981, 3115437

Int. Cl.[4] C10B *39/02*

U.S. Cl. 202—228 7 Claims

1. A device for dry cooling incandescent coke, comprising a closed cooling chamber having an upper end for receiving coke, a lower discharge end and a coke flow space between the receiving end and discharge end, a plurality of substantially

vertical spaced apart cooling walls extending across said flow space and subdividing the flow space into a plurality of separate vertical passages for the coke, said walls comprising superposed, substantially horizontal substantially rectangular abutting metal tubes communicating at respective ends with the next superjacent and subjacent rectangular tubes so as to form a continuous coolant flow passage, said cooling chamber being rectangular in horizontal cross-section, each wall extending in a vertical plane which is parallel and horizontally spaced from each other wall to form opposite planar vertical side surfaces for each vertical wall, said coolant flow passages at each end including a respective inlet and outlet connection and including a distributing line connected to every inlet connection and



a collecting line connected to every outlet connection, a plurality of partitions connected between adjacent ones of at least some of said walls for dividing said continuous coolant passage into a plurality of compartments, said partitions extending between adjacent walls and perpendicularly to said adjacent walls, and metered discharge means connected to said cooling chamber at said lower discharge end thereof for discharging coke from said compartments in a metered fashion, said metered discharge means including a plurality of separate discharge openings each for at least one compartment and each including a chute, and a tipping member at an end of each chute for metering out a selected amount of coke from each chute.

4,588,480

METHOD OF PRODUCING WEAR-PROTECTION LAYERS ON SURFACES OF STRUCTURAL PARTS OF TITANIUM OR TITANIUM-BASE ALLOYS

Martin Thoma, Munich, Fed. Rep. of Germany, assignor to MTU Motoren-und Turbinen-Union Munchen GmbH, Munich, Fed. Rep. of Germany

Filed May 22, 1984, Ser. No. 612,793

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1983, 3321231

Int. Cl.[4] C23C *18/36*; C25D *5/50*

U.S. Cl. 204—37.1 **17 Claims**

1. A method of producing a wear-protection coating on a surface of a structural part of titanium or a titanium-base alloy comprising applying a metallic nickel layer which adheres to the surface of the structural part, and subjecting the thus coated structural part to a heat treatment to form diffusion layers of Ti_2Ni and $TiNi_3$ between the titanium material, on the one hand, and the layer of nickel, on the other hand, and thereafter chemically removing all of the layer of nickel still present to expose one of the diffusion layers.

4,588,481

CHROMIUM PLATING BATH FOR PRODUCING NON-IRIDESCENT, ADHERENT, BRIGHT CHROMIUM DEPOSITS AT HIGH EFFICIENCIES AND SUBSTANTIALLY FREE OF CATHODIC LOW CURRENT DENSITY ETCHING

Hyman Chessin, Brick, and Kenneth R. Newby, Berkeley Heights, both of N.J., assignors to M&T Chemicals Inc., Woodbridge, N.J.

Filed Mar. 26, 1985, Ser. No. 716,062

Int. Cl.[4] C25D *3/10*

U.S. Cl. 204—51 **9 Claims**

1. A functional chromium plating process for producing a non-iridescent, adherent, bright chromium deposit on a basis metal at a cathode efficiency of at least 22% at a current density of 77.5 a.s.d. and a plating temperature of 55° C., which deposit is substantially free of grey or rough deposits or low current density etching, comprising

electroplating chromium on said metal at a temperature of 45°–70° C. from a chromium plating bath consisting essentially of chromic acid and sulfate, and a non-substituted alkyl sulfonic acid, or salt thereof, wherein the ratio of S/C is $\geqq \frac{1}{3}$.

4,588,482

PREPARATION OF PHTHALALDEHYDE ACETALS

Dieter Degner, Dannstadt-Schauernheim, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

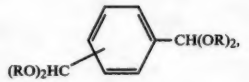
Filed Jun. 10, 1985, Ser. No. 743,091

Int. Cl.[4] C25B *3/02*

U.S. Cl. 204—59 R **4 Claims**

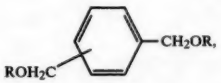
1. A process for the preparation of a phthalaldehye acetal of the formula

I



where R is alkyl of 1 to 4 carbon atoms, wherein an alkoxymethylbenzene of the formula

II



is electrolyzed in the presence of an alkanol of the formula ROH, where R has the above meaning, at a current density of from 0.1 to 20 A/dm^2 and at a temperature which is not less than 5° C. below the boiling point of the alkanol.

4,588,483

HIGH CURRENT DENSITY CELL

Kenneth E. Woodard, Jr.; David D. Justice, and Garland E. Hilliard, all of Cleveland, Tenn., assignors to Olin Corporation, Cheshire, Conn.

Filed Jul. 2, 1984, Ser. No. 626,963

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1982, 3245679

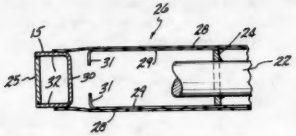
Int. Cl.[4] C25B *1/34*

U.S. Cl. 204—59 R **27 Claims**

20. A method of operating a filter press membrane electrolytic cell having at least one cathode and one anode sandwiched about a permselective ion exchange membrane, the cathode having a first layer with an active surface and a second layer supporting the first layer, comprising the steps of

(a) operating the cell at greater than a 4.0 kiloampere per

square meter current density at about one atmosphere pressure; and



(b) maintaining a voltage coefficient less than or equal to about 0.20 volts per kiloampere per square meter.

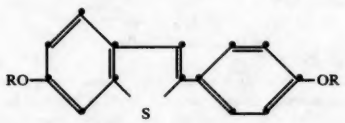
4,588,484

ELECTROCHEMICAL REDUCTION OF 3-CHLOROBENZO[B]THIOPHENES

Richard M. Justice, Jr., and David A. Hall, Indianapolis, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

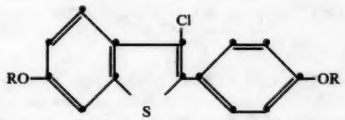
Filed Feb. 28, 1985, Ser. No. 707,001
Int. Cl.[4] C25C *1/00*
U.S. Cl. 204—59 R **3 Claims**

1. A process for preparing a 3-hydrobenzo[b]thiophene of the formula



I

wherein each R independently is C_1–C_4 alkyl, C_5–C_7 cycloalkyl or benzyl, comprising electrochemically reducing a 3-chlorobenzo[b]thiophene of the formula



II

at or above the reduction potential required for the cleavage of the chlorine atom at the 3-position of a compound of formula II but below the reduction potential of a compound of formula I.

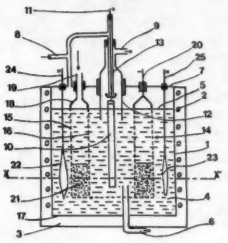
4,588,485

PROCESS FOR THE PRODUCTION OF A METAL BY ELECTROLYZING HALIDES IN A MOLTEN SALT BATH, COMPRISING A SIMULTANEOUS AND CONTINUOUS DOUBLE DEPOSIT

Joseph Cohen, Paris, and Gérard Lorthioir, Vitry-sur-Seine, both of France, assignors to Pechiney, Paris, France

Filed Mar. 5, 1985, Ser. No. 708,520
Claims priority, application France, Mar. 12, 1984, 84 03967
Int. Cl.[4] C25C *3/00, 3/26, 3/32, 3/34*
U.S. Cl. 204—64 R **11 Claims**

1. A process for the production of a metal by electrolyzing halides in a molten halide bath comprising a simultaneous and continuous deposit double, characterised in that a direct electric current I_1 is firstly circulated from an anodic system to a cathode in the form of a basket, both of these being immersed in the bath, while feeding the basket with a halide of the metal to be deposited, until the quantity of electricity produced corresponds to a filling of from $\frac{1}{4}$ to $\frac{3}{4}$ of the volume of the basket by the metal, then the halide of the metal is introduced into the compartment demarcated by the interior walls of the basket, such that a combined metal content of from 1 to 7% by weight is obtained, then a current I_2 is simultaneously circulated with the current I_1, from the basket to at least one complimentary cathode, while continuing to feed the basket with



halides, and the said complimentary cathode is periodically extracted to recover the metal obtained and replace it by another cathode.

4,588,486

ETCHING OF ALUMINUM CAPACITOR FOIL

Trung H. Nguyen, Williamstown, Mass., and Clinton E. Hutchins, Pownal, Vt., assignors to Sprague Electric Company, North Adams, Mass.

Filed Apr. 19, 1985, Ser. No. 725,180
Int. Cl.[4] C25F *3/04*
U.S. Cl. 204—129.43 **6 Claims**

1. A process for electrochemical etching of aluminum capacitor foil comprising passing said foil through a bath of electrolyte while under the influence of direct current pulses having an interval between each of said pulses, said bath being an aqueous solution containing 50 g/l to the saturation amount of sodium chloride and 5 to 75 g/l of sodium sulfate, said pulses having a duration of at least nine times that of said interval and having a current density of 2 to 10 A/in^2, and said etching being carried out at 50° to 90° C.

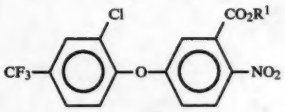
4,588,487

PROCESS FOR THE PREPARATION OF 3'-HALODIPHENYLETHERS

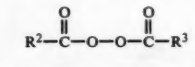
Barry C. Lange, Levittown, and Edward M. Szapacs, Center Valley, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Sep. 16, 1985, Ser. No. 776,350
Int. Cl.[4] C07C *41/18, 43/263;* B01J *19/12*
U.S. Cl. 204—157.82 **10 Claims**

1. A process for preparing 2-chloro-4-trifluoromethyl-3'-bromo-4'-nitrodiphenylether which comprises reacting a diphenylether having the formula:



where R^1 is an alkali metal or alkaline earth metal salt with a diacyl peroxide having the formula:



where R^2 and R^3 are, independently aliphatic, aromatic or alkylaromatic; and molecular bromine in a polar aprotic solvent, at about atmospheric pressure, in a substantially inert

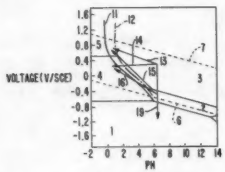
atmosphere at temperatures from about 65° C. to about 150° C. and optionally in the presence of light.

4,588,488

METHOD OF REMOVING OXIDE ON METAL SURFACE

Osao Sumita, Hitachi; Masayuki Saito, Mito; Hisao Itou; Masahito Kobayashi, both of Hitachi, and Yasumasa Furutani, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Engineering Co., Ltd., Ibaraki, both of, Japan

Continuation of Ser. No. 322,207, Nov. 17, 1981, abandoned.
This application Jun. 6, 1984, Ser. No. 617,917
Claims priority, application Japan, Nov. 17, 1980, 55-162458
Int. Cl.[4] C25F *1/06*
U.S. Cl. 204—145 R 24 Claims



1. A method of removing an oxide on a metal surface comprising the steps of:

immersing a metallic part bearing an oxide film thereon in an aqueous solution, said solution containing a complexing agent selected from the group consisting of polyaminocarboxylic acids, polyaminocarboxylic acid salts and carboxylic acids, and a reducing agent selected from the group consisting of L-ascorbinic acid, riboflavin, rose Bengal, rhodamine B, Cr^{2+} and Sn^{2+}, in a concentration of at least 0.002 mol/l, and having a pH of 4 to 9; and

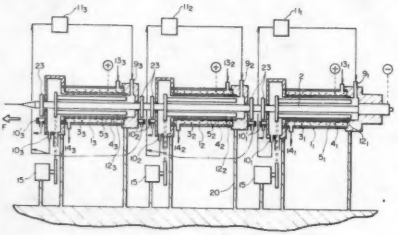
effecting cathodic electrolysis of the aqueous solution, under application of an electrochemical potential of lower than the Fermi level of the oxide, between an anode and cathode immersed in the solution to reduce part of the solution, at a temperature of lower than 200° C., the metallic part being brought into contact with the reduced solution, thereby to reduce and dissolve the oxide film while suppressing corrosion of the metal surface.

4,588,489

METHOD AND APPARATUS FOR MANUFACTURE OF LAMINATE OF FIBROUS SUBSTANCE HAVING ELECTROPHORETIC CHARGE

Tohshichi Kitago; Masaharu Fujita, and Seishiyo Kumagai, all of Fukushima, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 7, 1983, Ser. No. 502,058
Claims priority, application Japan, Jun. 7, 1982, 57-96286
Int. Cl.[4] C25D *1/18*
U.S. Cl. 204—180.9 7 Claims



1. A method for the manufacture of a laminate of layers of fibrous substances having an electrophoretic charge by an electrodepositing technique using an electrodepositing apparatus comprising an inner electrode adapted to accumulate said fibrous substances on the surface thereof and a plurality of outer electrodes of the opposite pole and a number of electrodepositing zones corresponding to the number of said plurality of outer electrodes for accommodating aqueous suspensions of said fibrous substances, said electrodepositing zones being spaced suitably along said inner electrode, said method comprising the steps of: feeding at least to adjacent electrodepositing zones said aqueous suspensions of fibrous substances having dissimilar properties or causing said fibrous substances to be oriented in different directions at least in said adjacent electrodepositing zones and applying an electric potential between said inner electrode and each of said plurality of outer electrodes thereby allowing said fibrous substances to be accumulated on the surface of said inner electrode, said inner electrode being disposed horizontally.

4,588,490

HOLLOW CATHODE ENHANCED MAGNETRON SPUTTER DEVICE

Jerome J. Cuomo, Lake Lincolndale, N.Y.; Harold R. Kaufman, Fort Collins, Colo., and Stephen M. Rossnagel, White Plains, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 22, 1985, Ser. No. 736,918
Int. Cl.[4] C23C *15/00*
U.S. Cl. 204—298 17 Claims

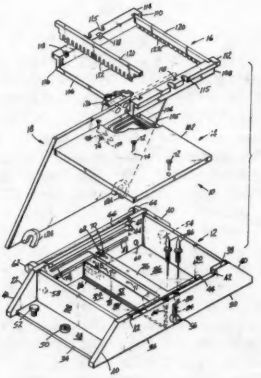
1. An etching/deposition system comprising a hollow cathode electron source in combination with a plasma sputter etching/deposition device within a containment chamber, said hollow cathode being disposed to inject electrons into the energy field of the plasma device adjacent to a workpiece to be processed by said system, means for initiating and maintaining a thermionic electron discharge plasma within the hollow cathode and for initiating and maintaining the device plasma, and means for introducing an ioniziable gas into said system.

4,588,491

HORIZONTAL GEL ELECTROPHORESIS DEVICE

John H. Kreisher, Ridgefield; Hal D. Belle Isle, and Charles A. Nalbantian, both of New Haven, all of Conn., assignors to International Biotechnologies, Inc., New Haven, Conn.

Filed Feb. 27, 1984, Ser. No. 584,138
Int. Cl.[4] G01N *27/28*
U.S. Cl. 204—299 R 19 Claims



1. A horizontal gel electrophoresis device comprising a generally flat shelf, two side-by-side, horizontally disposed

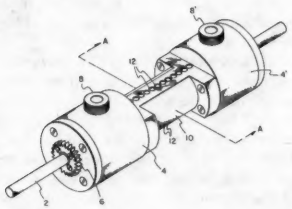
buffer chambers for containing buffer fluid positioned directly beneath said shelf with said shelf running between said chambers to provide buffer fluid directly beneath said shelf, a movable gel tray positioned on said shelf for containing gel and analyzing samples, an electrode in each buffer chamber, a removable top for said buffer chambers, a central divider means positioned directly below said shelf separating each of said buffer chambers and together with said shelf forming a fluid-tight separation therebetween, a valve means in said central divider means for controlling fluid flow between said buffer chambers, and a port in each of said buffer chambers for feeding fluids into said buffer chambers.

4,588,492

ROTATING APPARATUS FOR ISOELECTRIC FOCUSING

Milan Bier, Tucson, Ariz., assignor to University Patents, Inc., Westport, Conn.

Filed May 7, 1984, Ser. No. 609,404
Int. Cl.[4] G01N *27/28*
U.S. Cl. 204—301 **8 Claims**



1. In an isoelectric focusing apparatus including an elongated separation chamber bounded by electrode chambers across which a voltage may be applied, said chambers adapted to be filled with an electrolyte, the improvement comprising;

filter means dividing said separation chamber into a plurality of contiguous chambers, each of said filter means adapted to enable the ready passage therethrough of proteins to be focused;

access means communicating with each said contiguous chamber;

means for introducing a fluid to be fractionated into said contiguous chambers;

means for imparting to said separation chamber movement about its elongated dimension; and

means for collecting individually and substantially simultaneously after separation, the contents of each said contiguous chamber via said access means.

4,588,493

HOT GAS MEASURING PROBE

Robert N. Blumenthal, 17470 Bard Ct., Brookfield, Wis. 53005, and Andreas T. Melville, 204 N. 86th St., Milwaukee, Wis. 53226

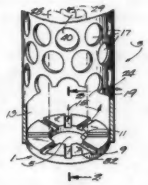
Filed Sep. 17, 1984, Ser. No. 651,227
Int. Cl.[4] G01N *27/58*
U.S. Cl. 204—410 **30 Claims**

1. In an oxygen sensor for measuring the properties of a gas inside a furnace having a solid electrolyte means with an interior surface and an exterior surface; a first electrode in contact with the interior surface of the electrolyte; a second electrode having a surface in contact with the exterior surface of the electrolyte; conductor means for conducting a voltage generated between the first and second electrodes in correspondence with gas properties; and sheath means having a generally tubular wall surrounding the electrodes and electrolyte for supporting the electrodes and electrolyte within the furnace, the improvement wherein:

a. said second electrode is unitarily connected to the sheath means to substantially close one end thereof;

b. said sheath means being an electrical conductor to enable the sheath means to conduct the voltage from the second electrode;

c. said second electrode and said electrolyte having cooperating wall means defining gas passages to allow passage of gas past the points of contact of the second electrode and said electrolyte and into the interior of the sheath means, said cooperating wall means providing a line contact of non-noble metal electrode and electrolyte, and said gas passages affording adequate gas exchange at the line contact between the electrolyte and second electrode to minimize chemical reactions and provide representative measurements.

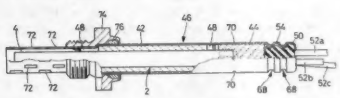


4,588,494

OXYGEN SENSOR

Nobuhide Kato, Aichi, and Takao Murase, Konan, both of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Mar. 8, 1985, Ser. No. 709,802
Claims priority, application Japan, Mar. 16, 1984, 59-38406[U]
Int. Cl.[4] G01N *27/04, 27/58*
U.S. Cl. 204—426 **22 Claims**



1. An oxygen sensor including an elongate planar oxygen sensing element having a first longitudinal end and a second longitudinal end, wherein an oxygen detecting portion is adjacent to said first longitudinal end, said detecting portion being exposed to a measurement gas to determine an oxygen concentration of said measurement gas, said sensing element being electrically connected to at least one external device through at least one conductor member, wherein the improvement comprises:

a protective covering having a first longitudinal end and a second longitudinal end, said protective covering accommodating therein said sensing element;

a rubber plug having a first end and a second end, whereby said second end is press-fitted into said first longitudinal end of said protective covering, said at least one conductor member extending through said rubber plug;

an electrical insulating member disposed between and retained by said second longitudinal end of said sensing element and said second end of said rubber plug;

electrical terminal means formed on said sensing element, adjacent to said second longitudinal end thereof, said electrical terminal means including at least one pair of electrical contacts disposed in said electrical insulating member; and

connector means disposed adjacent to said electrical terminal means, and including connectors which are electrically connected to said conductor members and are

fixedly supported in said electrical insulating member, said connectors being held in direct electrical contact with said at least one pair of electrical contacts.

4,588,495

CATALYTIC REFORMING PROCESS

Jean-Pierre Franck, Bougival, and Jean-Paul Bournonville, Chatou, both of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Feb. 22, 1985, Ser. No. 704,456

Claims priority, application France, Feb. 23, 1984, 84 02926

Int. Cl.[4] C10G *35/06*

U.S. Cl. 208—65 **13 Claims**

1. In a catalytic reforming process wherein a charge is circulated successively through a first catalyst bed and then at least one further catalyst bed, the improvement wherein the catalyst of the first bed comprises a carrier of alumina base and, by weight in proportion to the carrier, 0.05–0.6% of platinum, 0.005–3% of rhenium and 0.1–15% of at least one halogen and wherein each catalyst of the other beds contains a carrier of alumina base and, by weight with respect to the carrier, 0.05–0.6% of platinum, 0.05–3% of at least one metal promoter selected from the group consisting of tin, thallium and indium and 0.1–15% of at least one halogen, the proportion by weight of the catalyst containing platinum and rhenium ranging from 8 to 40% with respect to the total catalyst mass used in all the catalyst beds.

4,588,496

PROCESS FOR THE CATALYTIC CRACKING OF METALS-CONTAINING FEEDSTOCKS

Julius Scherzer, Anaheim, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Jan. 3, 1985, Ser. No. 688,567

Int. Cl.[4] C10G *11/05*

U.S. Cl. 208—120 **27 Claims**

1. A process for the catalytic cracking of a metals-containing hydrocarbon feedstock which comprises contacting said hydrocarbon feedstock with a cracking catalyst under cracking conditions in the sustantial absence of added molecular hydrogen in a cracking zone to convert components of said feedstock into lower molecular weight constituents, wherein said cracking catalyst comprises (1) a porous, inorganic refractory oxide component in combination with (2) a dealuminated Y zeolite having a silica-to-alumina mole ratio greater than about 6.0, said zeolite having been prepared by contacting a Y zeolite with an aqueous solution of a fluorosilicate salt.

4,588,497

PROCESS FOR THE CATALYTIC REFORMING OR AROMATIC HYDROCARBONS PRODUCTION

Gilbert Blanchard, Le Plessis Belleville, and Jean-Pierre Franck, Bougival, both of France, assignors to Societe Francais des Produits pour Catalyse Pro-Catalyse chez Institut Francais du Petrole, Rueil-Malmaison, France

Filed Dec. 7, 1984, Ser. No. 679,665

Claims priority, application France, Dec. 9, 1983, 83 19716

Int. Cl.[4] C10G *35/06*

U.S. Cl. 208—138 **15 Claims**

1. In a catalytic reforming process wherein a hydrocarbon feed is contacted under reforming conditions with a catalyst consisting essentially of (a) a carrier consisting essentially of a major part of alumina and, (b) an active phase containing at least one metal from group VIII and at least one additional metal or promoter, wherein the carrier is obtained by a method comprising admixing a binding agent consisting essentially of a major part of alumina base, with a charge, consisting essentially of a major part of alumina base, shaping and drying the resultant mixture, the proportion by weight of the binding agent amounting to 15–40% of the total carrier, the proportion by weight of the charge amounting to 60–85% of the total carrier, the alumina binding agent consisting essentially of dispersed alumina and 0–30% of non-dispersed alumina, the alumina charge consisting essentially of non-dispersed alumina and 0–10% of dispersed alumina the dispersion rate of the composition resulting from the mixture of the binding agent with the charge being from 10 to 60%,

the improvement wherein in said method at least a portion of a source of said additional metal is introduced into the binding agent or into the charge prior to completion of the formation of said carrier.

4,588,498

SINGLE FLOAT STEP PHOSPHATE ORE BENEFICIATION

Alexander D. Mair, and Myra M. Soroczak, both of Florence, Ala., assignors to Tennessee Valley Authority, Muscle Shoals, Ala.

Continuation of Ser. No. 708,914, Mar. 6, 1985, now Defensive Publication No. T106,002. This application Mar. 28, 1985, Ser. No. 717,059

Int. Cl.[4] B03D *1/02*

U.S. Cl. 209—9 **23 Claims**

1. An improved single stage flotation process eminently suitable for beneficiating phosphate ores containing, as impurities, silica and alkaline earth metal carbonates, which process comprises the steps of:

(a) comminutating and classifying, to predetermined size, a feed or phosphate ore containing, as impurities, silica and alkaline earth metal carbonates

(b) conditioning the resulting, sized, phosphate ore particulate feed by subjecting same to sulfidization treatment whereby the surfaces of the minerals, comprising the phosphate values therein, are selectively sulfidized with adsorbed water insoluble metal sulfide, the metal constituent of said sulfide being substantially copper

(c) conditioning the resulting, sulfidized, sized, phosphate ore particulate feed by contacting same with sulfide mineral collecting reagent

(d) introducing the resulting, conditioned, particulate feed into single stage froth flotation means, wherein are maintained oxidizing conditions, and effecting flotation thereof

(e) recovering as product from said single stage froth flotaton means, in the overflow therefrom, a substantial portion of the phosphate values of the feed thereto and,

(f) simultaneously removing as byproduct from said single stage froth flotation means, in the underflow therefrom, both the resulting separated silica and the separated carbonate gangue minerals.

4,588,499

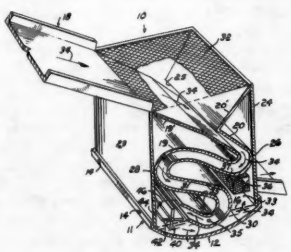
GRAVITY FLOW AMALGAMATOR

Earnest Z. Coker, 1525 SW. 23, Oklahoma City, Okla. 73108

Continuation-in-part of Ser. No. 637,091, Sep. 2, 1984, abandoned. This application May 17, 1985, Ser. No. 735,413

Int. Cl.[4] B03B *5/60*

U.S. Cl. 209—189 **3 Claims**



1. A gravity amalgamator, comprising:

a vertically elongated upright housing having opposing side walls and an open top end and having an outlet opening in one of its side walls;

a tray having a bottom wall closing the bottom end of said housing;

mercury substantially filling said tray; and,

partition means including a pair of parallel partition walls for forming oppositely disposed fluid compartments in the housing and a fluid path extending downward through said housing and communicating at its depending end with at least one of the fluid compartments,

the end portion of said pair of walls, opposite the housing top end, describing an arcuate downward and upward bend in which one wall of said pair of walls intersects the level of mercury in said tray and forms a Venturi throat in combination with the tray bottom wall between the oppositely disposed fluid compartments,

said pair of walls terminating in spaced relation above the level of said mercury,

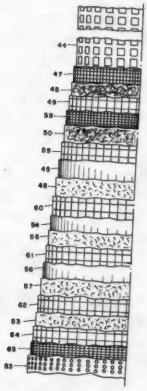
each wall of said pair of walls having a plurality of spaced-apart apertures at the lowermost position of the arcuate downward and upward bend.

4,588,500

FUEL FILTER AND DEHYDRATOR

Gregory S. Sprenger, LaGrange, Ga., and Noel E. Knight, West Wickham, United Kingdom, assignors to Kaydon Corporation, Muskegon, Mich.

Filed Sep. 4, 1984, Ser. No. 646,523
Int. Cl.[4] B01D *27/10*
U.S. Cl. 210—100 **29 Claims**



1. A fuel filter dehydrator apparatus comprising:

a container having a fuel inlet and a fuel outlet;

a support plate having a plurality of openings therethrough and being positioned within said container and forming therebetween an outlet manifold in communication with said container outlet;

a cover plate being removably fixed to said container to form a fuel inlet chamber within said container;

a plurality of hollow filter elements disposed within the inlet chamber and extending between said support plate and said cover plate, and communicating with said outlet manifold through respective ones of said support plate openings, each of said filter elements having a rigid, porous tube having a top end and a bottom end, a plurality of thin, tough, diaphragm-like water retaining cellulose fiber sheets placed about said tube and a plurality of water coalescing fiberglass layers placed about said tube, said water retaining cellulose fiber sheets having a decrease in fluid permeability upon saturation which automatically shuts off fluid flow therethrough; said water retaining cellulose fiber sheets being interleaved with said water coalescing fiberglass layers, one of said fiberglass layers being disposed upstream of one of said cellulose sheets, whereby diaphrarm-like sheets of saturated cellulose have a compressive effect on downstream layers of fiberglass further decreasing the fluid permeability of said downstream sheets of cellulose by releasing water coalesced in said fiberglass thereto and thus amplifying the fuel shut off effect;

means for securing said fiberglass sheet and said cellulose fiber layer to said tube; and

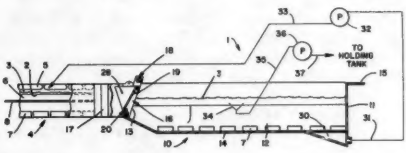
means for connecting said ends of said filter elements to said support plate and said cover plate, whereby a fuel to be filtered enters said container inlet, passes through said filtering elements wherein coalescence and water retention occurs, and thereafter flows into said outlet manifold for passage through said container outlet, until at least one of said water retaining cellulose fiber sheets becomes saturated with water, decreasing the fluid permeability of said cellulose fiber and automatically shutting off fuel flow therethrough.

4,588,501

APPARATUS FOR COLLECTING AN IMMISCIBLE LIQUID FROM THE SURFACE OF A BODY OF HIGHER DENSITY LIQUID

Roland H. Jordan, Redondo Beach, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Aug. 25, 1983, Ser. No. 526,565
Int. Cl.[4] B01D *35/00*
U.S. Cl. 210—109 **4 Claims**



1. An apparatus for removing oil from the surface of a body of water, the operation of which is substantially independent of fluctuations in the surface level of the body of water and which moves, relative to the oil, in one forward direction, comprising:

a catch basin having a closed bottom and an open top, and made of flexible material which is impervious to air, oil, and water;

a flexible flotation means for flexibly supporting the catch basin above the surface level of the water to allow said catch basin to ride the surface of the water in a serpentine fashion without regard to fluctuations in the surface level height;

a liquid inlet formed in said catch basin;

a self-adjustable weir horizontally disposed across said liquid inlet of said catch basin and means for adjusting said weir at a constant height under the surface of the water so that only the top layer of the body of water, which contains the oil, will be collected;

means for vertically hinging both sides of said weir to said catch basin so that all liquids are forced over the top of said weir and prevented from going past the ends of the weir;

a liquid outlet located in the bottom of said catch basin to permit removal of water from beneath the overlying oil in said catch basin and to establish flow over the top of said weir thereby increasing concentration of oil in said catch basin;

a first pump to remove water from said catch basin through

said liquid outlet and to pump water back into said body of water to assist in directing the oil over the weir;

a second pump having an intake in the oil phase above the oil/water interface to remove the oil from the basin; and

means for moving said apparatus forward, in one direction, relative to the oil on the surface of a body of water.

4,588,502

SIEVE DEVICE FOR CLEANING MOLTEN PLASTICS

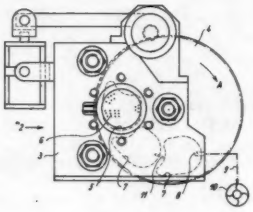
Bodo Zibell, Porta Westfalica; Hubert Patrovsky, Löhne, and Detlef Gneuss, Bad Oeynhausen, all of Fed. Rep. of Germany, assignors to Detlef Gneuss, Bad Oeynhausen, Fed. Rep. of Germany

Filed Sep. 6, 1984, Ser. No. 647,929

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1983, 3344002

Int. Cl.[4] B01D *35/12*

U.S. Cl. 210—171 **2 Claims**



1. In a sieve device, for cleaning molten plastics supplied from a high-pressure press having an output flow channel, of the type having a housing with a flow-through bore communicatable with the flow channel of the high-pressure press, a plate mounted for displacement with respect to the housing and having several perforations therein, with the plate configured such that at least one perforation is always inside the housing, at least one perforation is always aligned with the flow-through bore, and a sieve disposed in a flow path formed by the flow-through bore and the aligned perforation, the improvement comprising: at least two perforations always inside the housing but outside the flow-through bore, and means for evacuating each perforation which is inside the housing but outside the flow-through bore before said perforation enters the flow-through bore upon displacement of the plate comprising a suctioning-off bore inside the housing and in a flow-through area of a perforation, a suctioning-out pump that communicates with the suctioning-off bore through a line, wherein the suctioning-off bore is spaced apart from the flow-through bore by a distance sufficient to permit one perforation between the perforation that is to be evacuated through the suctioning-off bore and suctioning-out pump and the perforation that is inside the flow-through bore of the housing.

4,588,503

LIQUID FILTER ASSEMBLY

Eiichi Sugiura, 149, Matsumotocho, Hekinan-shi, Aichi, Japan

Continuation of Ser. No. 403,545, Jul. 30, 1982, abandoned. This application Mar. 27, 1984, Ser. No. 593,195

Claims priority, application Japan, Jul. 29, 1981, 56-118652

Int. Cl.[4] B01D *25/00*

U.S. Cl. 210—232 **4 Claims**

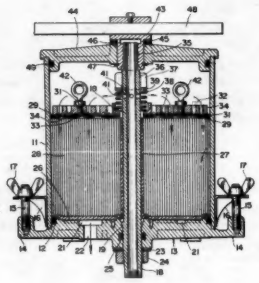
1. A liquid filter assembly, comprising:

a cylindrical casing positionable in an upstanding position and having an upper end and a lower end;

a roll of filtering material disposed within said casing and having a length dimension less than said casing and oriented upstanding within said casing when said casing is positioned upstanding so as to define within said casing an open space above an upper end face of said roll of filtering material;

a non-woven fabric sheet-like filter element disposed on and covering said upper end face of said roll of filtering material;

a filter element retainer movably disposed within said casing and resting on said sheet-like filter element so as to press said sheet-like filter element against the upper end face of said roll of filtering material, said filter element retainer comprising a disc having a pair of opposed flat surfaces and having openings therethrough which open at said flat surfaces to define liquid flow paths from the open space within said casing above said roll of filtering material



down to said sheet-like filter element, one of said disc flat surfaces having surface grooves for defining liquid flow paths thereacross, and said disc being positioned with said one flat surface having the surface grooves pressing against said sheet-like filter element;

means for biasing said filter element retainer to press said sheet-like filter element against the upper end face of said roll of filtering material;

means defining an inlet for introducting liquid to be filtered into the open space within said casing above said roll of filtering material; and

means defining an outlet for removing filtered liquid after it has flowed through said sheet-like filter element and said roll of filtering material.

4,588,504

OIL CIRCUIT COUPLER FOR AN OIL-SEALED VACUUM PUMP

Hanns-Peter Berges, Cologne, and Wolfgang Leier, Bergisch Gladbach, both of Fed. Rep. of Germany, assignors to Leybold-Heraeus GmbH, Cologne, Fed. Rep. of Germany

Filed Oct. 1, 1985, Ser. No. 782,610

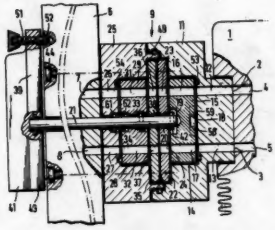
Claims priority, application Fed. Rep. of Germany, Oct. 2, 1984, 3436079

Int. Cl.[4] F04C *27/02;* **F04B** *39/16*

U.S. Cl. 210—234 **11 Claims**

1. In an oil-sealed vacuum pump having an oil circuit in which pump oil is circulated; said oil circuit having an outer circuit portion situated externally of the pump and an inner circuit portion within the pump; first and second ports in said pump connecting said outer circuit portion to said inner circuit portion; a filter assembly situated externally of said pump and connected in said outer circuit portion; and a coupler connected in said outer circuit portion and having first and second operating positions for maintaining communication between or, respectively, sealing said filter assembly from said inner circuit portion; the improvement wherein said coupler comprises a rotatably supported valve disc having a first face oriented towards said first and second ports and a second face oriented towards said filter assembly; said valve disc further having first and second apertures passing through the valve

disc and having a predetermined distance from one another and a groove provided in said first face and oriented approximately perpendicularly to an imaginary line connecting said first and second apertures with one another; and actuating means for rotating said valve disc into a first position in which said first and second apertures are in registry with said first and second ports, respectively, to maintain communication be-



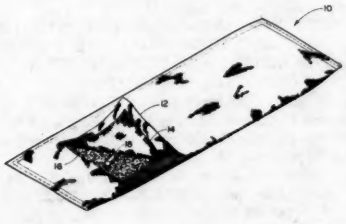
tween said filter assembly and said inner circuit portion and for rotating said valve disc into a second position in which said first and second apertures are out of registry with said first and second ports to block communication between said filter assembly and said inner circuit portion and in which said groove is in registry with said first and second ports to maintain a direct communication between said first and second ports for short-circuiting said inner circuit portion.

4,588,505

WATER SCAVENGER POUCH

David H. Walley, Stillwater, and James C. Fitch, Tulsa, both of Okla., assignors to Frontier Technology, Inc., Muskogee, Okla.

Filed May 7, 1984, Ser. No. 608,028
Int. Cl.⁴ B01D 27/02
U.S. Cl. 210—502.1 **2 Claims**



1. A water absorption pouch comprising:
(a) an open-mesh, hydrocarbon impervious, cloth container confining a water absorbent polymer mixture and ballast;
(b) a water absorbent polymer phase mixture selected from the group consisting of an alkali metal hydrolyzed starch/acrylonitrile copolymer or an alkali metal alkylcarboxamide copolymer mixed with a carboxymethyl cellulose or hydroxyethyl cellulose polymer; and
(c) sufficient ballast confined within said open-mesh, cloth container to make said pouch settle to the bottom of a hydrocarbon liquid.

4,588,506

STIMULATION OF BIOOXIDATION PROCESSES IN SUBTERRANEAN FORMATIONS

Richard L. Raymond, Wilmington, Del.; Richard A. Brown, Trenton, N.J.; Robert D. Norris, Cranbury, N.J., and Eugene T. O'Neill, Hightstown, N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Nov. 8, 1984, Ser. No. 669,408
Int. Cl.⁴ C02F 3/02
U.S. Cl. 210—606 **24 Claims**

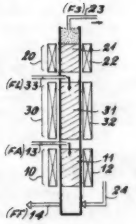
1. A process in which oxygen and nutrients are effectively supplied to biota for stimulating the biooxidation of a contaminant within a subterranean formation containing groundwater comprising introducing an aqueous solution of hydrogen peroxide into at least one site of the subterranean formation, the 24-hour average concentration of the hydrogen peroxide initially introduced being between 0.0001% and 0.1% and increasing the 24-hour average concentration of hydrogen peroxide with time at a rate sufficient to provide a corresponding increase in oxygen available to the biota within the subterranean formation to bioxidize said contaminant but without providing a toxic environment to the biota, and increasing intermittently the hydrogen peroxide concentration introduced into the formation for a short time sufficiently to be toxic to biota at or closely adjacent to the site of introduction thereof thereby removing the biota and thus increasing the permeability of the formation at or adjacent to the site of hydrogen peroxide introduction and degrading said biota into cell material providing nutrients to biota remove from said site.

4,588,507

ELECTROMAGNETIC FILTER

Didier Saudray, Orange, and Pierre Auchapt, Roquemann, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jan. 6, 1984, Ser. No. 568,741
Claims priority, application France, Jan. 11, 1983, 83 00330
Int. Cl.⁴ B01D 35/06
U.S. Cl. 210—695 **11 Claims**



1. An electromagnetic filter comprising a filtration section which comprises a first magnetizable lining associated with first means for applying a first regulable magnetic field, a first pipe for introducing a solution containing the products to be filtered issuing into the upper part of said filtration section and a second pipe for extracting the clarified solution issuing into the lower part of said filtration section, a discharge section, disposed above the filtration section, for discharging the filtration products said discharge section comprising a second magnetizable lining associated with second means for applying a second regulatable magnetic field, said discharge section having a discharge pipe in communication with its upper part, a pulsation leg in communcation with the lower part of the filtration section and producing, at least one pulsation having a first phase in which the column of solution present in the filter is subject to an upward movement and a second phase in which this column is subject to a downward movement said first and second means for applying said first and second magnetic fields to said first and second linings of the filtration and discharge

sections being regulatable in synchronism with said pulsation, these fields producing in said first and second linings of the two sections, the filtration of the solution passing through them during the second pulsation phase, and permitting their entrainment during the second phase.

4,588,508

BIMODAL CATIONICS FOR WATER CLARIFICATION

Stephan J. Allenson, Richmond, Tex., and Stephen D. Wagner, Bakersfield, Calif., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Nov. 13, 1984, Ser. No. 670,518
Int. Cl.[4] C02F *1/56*
U.S. Cl. 210—708 **5 Claims**

1. A method of coagulating and clarifying waste waters contaminated with oils and suspended inorganic and/or organic solids which comprises the steps:

I. Adding to said waste waters an effective amount of a cationic polymer admixture comprising:

a. a first water-soluble cationic homopolymer of a vinylic cationic monomer chosen from the group consisting of diallyldimethyl ammonium chloride, dimethylaminoethyl methacrylate and its acid or quaternary salts, methacrylamidoproply trimethyl ammonium chloride and 1-acrylamido-4-methyl piperazine, N-methyl quaternary salt, said homopolymer having a weight average molecular weight ranging between about 2,500–800,000, in admixture with,

b. a second water-soluble cationic copolymer of acrylamide and a vinylic cationic monomer chosen from the group consisting of diallyldimethyl ammonium chloride, dimethylaminoethyl methacrylate and its acid or quaternary salts, methacrylamidopropyl, trimethyl ammonium chloride and 1-acrylamido-4-methyl piperazine, N-methyl quaternary salt, said second cationic copolymer having a weight average molecular weight ranging between about 1,000,000–50,000,000, wherein said polymer admixture contains a:b within a weight ratio of about 50:1 to 1:50, and thereby forming a treated waste water, and then,

II. vigorously agitating said treated waste water with or without admixture of a dispersion gas, and then,

III. allowing phase separation to occur forming a clarified water phase and a coagulated waste phase containing oils and suspended inorganic and/or organic solids, and then,

IV. recovering and reusing said clarified water and either recycling said waste phase or discarding or destroying said waste phase.

4,588,509

PROPPANT CONCENTRATOR

Patrick C. Hyde, and Van C. Burroughs, both of Fort Worth, Tex., assignors to The Western Company of North America, Fort Worth, Tex.

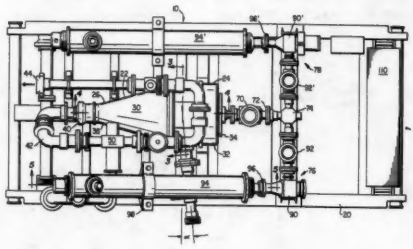
Filed Feb. 17, 1984, Ser. No. 581,342
Int. Cl.[4] B04C *1/00*
U.S. Cl. 210—788 **29 Claims**

1. An apparatus for concentrating the level of a proppant in a fluid under pressure comprising:

a conical chamber having a reduced diameter end with a discharge therein and an inlet for introducing a fluid and proppant mixture under pressure into said chamber substantially along a path tangential to the side wall of the chamber,

fluid extraction means comprising a reflux tube having one end positioned within said conical chamber for receiving fluid from said chamber and a second end communiating with a choke means for maintaining the pressure of the fluid upstream, said choke means effecting a pressure drop thereacross, and

energy absorber means for receiving said fluid removed from said fluid chamber and for dissipating the kinetic energy of said fluid prior to discharging said fluid from said absorber means, said absorber means comprising a housing having an inner chamber with an inlet for receiving fluid therein and a closed end opposite said inlet, said inner chamber having an aperture therethrough, said aperture being positioned remote from the closed end, and



an outer chamber surrounding said inner chamber to define an annular space therebetween and having an outlet therein remote from said aperture in the said inner chamber.

4,588,510

INTUMESCENT FIRE EXTINGUISHING SOLUTIONS

Ival O. Salyer, Dayton; Charles W. Griffen, Mason, and Donovan S. Duvall, Kettering, all of Ohio, assignors to University of Dayton, Dayton, Ohio

Filed Mar. 7, 1984, Ser. No. 587,103
Int. Cl.[4] A62C *1/12, 1/16;* A62D *3/12*
U.S. Cl. 252—5 **27 Claims**

1. A true, aqueous solution capable of intumescing upon exposure to intense heat flux or flame and extinguishing fires comprising about 10 to 30% by weight diammonium phosphate, about 15 to 35% by weight of a water soluble polyol capable of reacting with phosphoric acid and generating a flame-resistant polyester foam, said polyol having 2 to 12 carbon atoms and 2 to 8 hydroxyl groups, about 0.5 to 25% by weight of water soluble, thermally activated gas-generating agent, said gas-generating agent producing a non-flammable pneumatogen upon heating, 0 to about 5% by weight of a water soluble, salt-tolerant surfactant, and about 30 to 60% by weight water, said solution having a viscosity in excess of about 100 cps at 25° C.

4,588,511

FUNCTIONAL FLUIDS AND CONCENTRATES CONTAINING ASSOCIATIVE POLYETHER THICKENERS AND CERTAIN METAL DIALKYLDITHIOPHOSPHATES

Mark A. Frentrup, Dearborn; Stanley T. Hirozawa, Birmingham; James E. Carson, Lincoln Park, and Daniel E. Coker, Woodhaven, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Continuation-in-part of Ser. No. 568,865, Jan. 6, 1984. This application Jun. 10, 1985, Ser. No. 743,034
Int. Cl.[4] C10M *169/06, 173/02*
U.S. Cl. 252—32.7 E **42 Claims**

1. A functional fluid concentrate which comprises:

(a) cloud point raising basic zinc salt additive having an empirical formula which is represented by either

(i) $Zn_2[(RO)_2PS_2]_3OH$, or

(ii) $Zn_4[(RO)_2PS_2]_6O$

wherein R is a linear or branched alkyl, alkenyl, aryl, arylalkyl, or alkylaryl groups having from 1 to 24 carbon atoms;

(b) from 0.5 to 10.0 parts by weight of a polyether nonionic surfactant; and

(c) from 0.01 part to 50.0 parts by weight of an associative polyether thickener, said weights based upon 1.0 part by weight of the cloud point raising additive.

4,588,512

NONCORROSIVE DE-ICING COMPOSITION AND METHOD COMPRISING CALCIUM AND MAGNESIUM CARBOXYLATE

Wallace Rippie, 2030 Country Club Blvd., Ames, Iowa 50010

Continuation of Ser. No. 455,607, Jan. 4, 1983, abandoned. This application Aug. 13, 1985, Ser. No. 765,178

Int. Cl.[4] C09K *3/18; C07C 51/41;* **B32B** *7/02*

U.S. Cl. 252—70 **16 Claims**

1. A snow and ice control material for a surface, said material comprising an aggregate coated with a combination of a cement grinding aid and a composition selected from the group consisting of magnesium carboxylate and calcium carboxylate and mixtures thereof, wherein the carboxylate comprises from about 16.5 to 76 percent by weight on a dry weight basis of said material, wherein the carboxylate groups contains from 1 to 4 carbon atoms and wherein the aggregate possesses sufficient density so that when it is coated with the carboxylate and applied to the surface it will not readily be blown off of the surface by ambient wind conditions.

4,588,513

NON-BORATE, NON-PHOSPHATE ANTIFREEZE FORMULATIONS CONTAINING DIBASIC ACID SALTS AS CORROSION INHIBITORS

Carol A. Triebel; Jerome W. Darden, and Edward S. Peterson, all of Austin, Tex., assignors to Texaco, Inc., White Plains, N.Y.

Filed Nov. 19, 1984, Ser. No. 672,736

Int. Cl.[4] C09K *5/00*

U.S. Cl. 252—75 **2 Claims**

1. A corrosion inhibited antifreeze composition consisting of a water-soluble liquid alcohol freezing point depressant and an inhibitor mixture consisting of

a. about 1.8 to 5.0 wt.% of sodium sebacate,

b. about 0.14 to 1.0 wt.% of sodium metasilicate pentahydrate, and

c. about 0.05 to 0.5 wt.% of tolyltriazole, all based on the amount of liquid alcohol freezing point depressant present,

in the absence of amines, nitrites, nitrates, chromates, borates and phosphates.

4,588,514

LIQUID THICKENED BLEACHING COMPOSITION

Frank Jones, Dielheim, Fed. Rep. of Germany; David A. Reed, Irby, Great Britain; Jane A. Crompton, Tranmere, Great Britain, and Pedro M. Beramendi, Buenos Aires, Argentina, assignors to Lever Brothers Company, New York, N.Y.

Filed Sep. 19, 1984, Ser. No. 651,729

Claims priority, application United Kingdom, Sep. 23, 1983, 8325541

Int. Cl.[4] C11D *3/395, 7/52*

U.S. Cl. 252—98 **1 Claim**

1. A liquid, pourable, thickened bleaching composition having a viscosity of 10–200 cS at 25° C., consisting essentially of:

(i) an aqueous alkali metal hypochlorite solution in an amount such that the composition has an active chlorine content of 1–15% by weight;

(ii) from 0.5 to 5% by weight of a thickening agent consisting of:

(a) a sodium soap of a saturated C_8–C_{18} fatty acid or an alkali metal sarcosinate of the formula $R_4CON(CH_3)$-COOM, in which R_4 is a branched- or straight-chain C_{10}–C_{18} alkyl group and M is an alkali metal cation;

(b) a tertiary amine oxide of the formula $R_1R_2R_3N$ O in which R_1 is a C_8–C_{20} branched- or straight-chain alkyl group and R_2 and R_3 are branched- or straight-chain C_1–C_4 alkyl groups; and

(c) a C_{12}–C_{15} alkyl ether sulphate with 2–3 moles of ethylene oxide;

wherein the weight ratio of said saturated fatty soap or sarcosinate, tertiary amine oxide and alkyl ether sulphate is (10–15):(65–70):(15–25), the balance of the composition being essentially water, and all percentages being based upon the total weight of the composition.

4,588,515

GRANULAR AUTOMATIC DISHWASHER DETERGENT COMPOSITIONS CONTAINING SMECTITE CLAY

Stephen E. Schuh, Harrison, Ind., and Maria R. Smoot, Florence, Ky., assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Sep. 27, 1984, Ser. No. 655,383

Int. Cl.[4] C11D *9/42*

U.S. Cl. 252—99 **17 Claims**

1. A low sudsing granular detergent composition suitable for use in an automatic dishwashing machine comprising:

(a) from about 20% to about 95% by weight of detergency builder material;

(b) chlorine bleach ingredient to provide from about 0.2% to about 5% of available chlorine based on the weight of the detergent composition;

(c) from about 1% to about 15% of a low-foaming nonionic surfactant;

(d) from about 1% to about 50%, based on the weight of the nonionic surfactant of alkyl phosphate ester or mixtures thereof; and

(e) from about 0.5% to about 5% of a smectite clay.

4,588,516

CLEANING LIQUID AND PROCESS OF USING SAME

Lenore F. Schwartz, 1412 Mt. Pleasant Rd., Villanova, Pa. 19085

Filed Dec. 26, 1984, Ser. No. 686,239

Int. Cl.[4] C11D *1/825*

U.S. Cl. 252—174.21 **4 Claims**

1. A composition for cleaning cotton fabrics comprising in combination:

(a) about 2–12 weight percent of a dodecyl phenol with 8–9 ethylene oxide units in a side chain;

(b) about 2–12 weight percent of a nonyl phenol with 9 ethylene oxide units in a side chain;

(c) about 2–12 weight percent of a polyethylene glycol ether of a mixture of long chain (11–15 carbon atoms) fatty alcohols with 9 mols of ethylene oxide;

(d) about 0.5–50 weight percent of a polyoxyethylenepolyoxypropylene block copolymer defoaming agent;

(e) about 5–15 weight percent of 2-methyl-2, 4-pentane-diol; and

(f) about 20–30 weight percent of polyoxyethylene (20) oleyl ether.

4,588,517

LIQUID CRYSTAL COMPOSITION

Masaharu Kaneko, Yamato; Tomio Yoneyama, Kawasaki; Junko Iwanami, Yamato; Shuji Imazeki, Hitachi; Akio Mukoh, Mito, and Mikio Sato, Hitachi, all of Japan, assignors to Hitachi, Ltd. and Mitsubishi Chemical Industries, Ltd., both of Tokyo, Japan

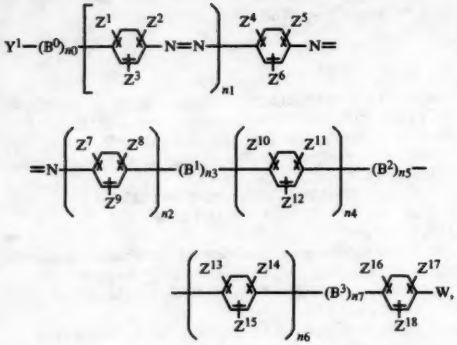
Filed Jun. 29, 1983, Ser. No. 509,051

Claims priority, application Japan, Jun. 30, 1982, 57-111690; Jun. 30, 1982, 57-111689

Int. Cl.[4] C09K *3/34;* **G02F** *1/13*

U.S. Cl. 252—299.1 **10 Claims**

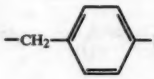
1. A liquid crystal composition comprising host liquid crystal composition and guest pleochroic dye dissolved in the composition, wherein the pleochroic dye is at least one member represented by the following general formula:



where

W: the group represented by the formula

R1 designating a straight chain alkyl group having 2 to 18 carbon atoms or the group



and in R1 a methylene group not adjacent to the nitrogen atom may be substituted by oxygen atom or sulfur atom, and R2 designates a hydrogen atom, an alkyl or alkoxy group having 1 to 7 carbon atoms, or a cyclohexyl group, and

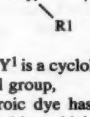
B^0, B^1, B^2, B^3: —N=N—, —N=CH—, —CH=N—, COO—, —OCO—, —COS—, —SCO—, —OCH_2—, —CH_2O—, —SCH_2—, —CH_2S—, —NHCO—, —CONH—, or —CH_2CH_2—, and

Z^1 to Z^{18}: Hydrogen atom, halogen atom, methyl group, hydroxyl group, methoxy group, or a cyano group; and Z^1 and Z^2, Z^4 and Z^5, Z^7 and Z^8, Z^{10} and Z^{11}, Z^{13} and Z^{14}, and Z^{16} and Z^{17} may be bonded together to form a naphthalene ring, and

n_0, n_3, n_5, n_7: zero or 1, and

n_1, n_2, n_4, n_6: zero, 1 or 2, with the proviso that n_3 is 0 when n_2 is 0, n_5 is 0 when n_4 is 0, and n_7 is 0 when n_6 is 0, and

Y^1: when n_0 is 0, Y^1 is a hydrogen atom, a halogen atom, an alkyl or alkoxy group having 1 to 18 carbon atoms, cyclohexyl group, a bicyclooctyl group, a nitro group, an aryl group, or a group shown by the formula



while when n^0 is 1, Y^1 is a cyclohexyl group, a bicyclooctyl group or an aryl group,

whereby said pleochroic dye has a solubility in the host liquid crystal composition which is improved as compared with corresponding pleochroic dyes not containing the end group W of the general formula, without reduction of the order parameter of said pleochroic dye in the host liquid crystal composition.

4,588,518

NEMATIC LIQUID CRYSTAL COMPOSITION FOR DISPLAY DEVICES

Tamihito Nakagomi; Kazuhisa Toriyama, both of Mobara, and Masatoshi Ito, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 29, 1979, Ser. No. 70,724

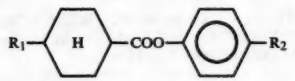
Claims priority, application Japan, Aug. 30, 1978, 53-104938

Int. Cl.[4] G02F *1/13;* C09K *3/34*

U.S. Cl. 252—299.61 **36 Claims**

1. A nematic liquid crystal composition for use in display devices comprising

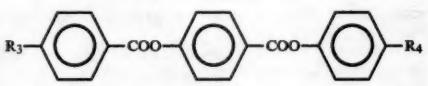
(a) at least one compound of the formula:



(I)

wherein R_1 is n—C_mH_{2m+1}, n—C_mH_{2m+1}—O, or n—C_mH_{2m+1}—CO; R_2 is n—C_qH_{2q+1}, n—C_qH_{2q+1}—O or n—C_qH_{2q+1}—CO; m and q are independently an integer of 1 to 10; and n is a symbol indicating that carbon atoms are linked linearly, and

(b) at least one compound of the formula:



(II)

wherein R_3 is n—C_rH_{2r+1} or n—C_rH_{2r+1}—O; R_4 is n—C_sH_{2s+1} or n—C_sH_{2s+1}—O; r and s are independently an integer of 1 to 10; and n is as defined above; and

(c) at least one nematic liquid crystal compound having positive dielectric anisotropy and/or its homologous compound in an amount of 4% by weight or more.

4,588,519

METHOD OF INHIBITING CORROSION OF IRON BASE METALS

Vincent R. Kuhn, Twin Lakes, Wis., assignor to Dearborn Chemical Company, Lake Zurich, Ill.

PCT No. PCT/US82/00122, § 371 Date Feb. 25, 1983, § 102(e) Date Feb. 25, 1983, PCT Pub. No. WO83/02628, PCT Pub. Date Aug. 4, 1983

PCT Filed Jan. 29, 1982, Ser. No. 473,157

Int. Cl.[4] C09K *3/00;* C23F *11/00, 11/04;* C04B *9/02*

U.S. Cl. 252—389 R **5 Claims**

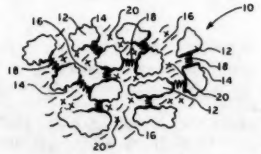
1. A process of inhibiting corrosion of iron based metals in contact with a cooling water system comprising incorporating into the cooling water system from 1 to 200 ppm of a composition comprising (A) a water soluble inorganic phosphate and (B) a copolymer of 2-acrylamido-2-methylpropane sulfonic acid and methacrylic acid in a molar ratio of from about 5:1 to 1:5, said copolymer having a weight average molecular weight of between 1,000 and 100,000; an alkali metal, alkaline earth metal, or ammonium salt of said copolymer; or a mixture of said salts; said composition having a weight ratio of component (A) to component (B) of from 100:1 to 1:100.

4,588,520

POWDER PRESSED THERMOELECTRIC MATERIALS AND METHOD OF MAKING SAME

Tumkur S. Jayadev, Rochester; On Van Nguyen, Sterling Heights; Jaime M. Reyes, Birmingham; Helen Davis, Royal Oaks, and Michael W. Putty, East Detroit, all of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed Sep. 3, 1982, Ser. No. 414,917
Int. Cl.[4] H01B 1/06
U.S. Cl. 252—512 5 Claims



1. A compacted powder material body for thermoelectric applications, said material comprising bismuth, tellurium, and tellurium, at least one highly conductive phase consisting essentially of silver and tellurium, and tellurium iodide dopant, said material containing about 10 atomic percent bismuth, about 30 atomic percent antimony, about 60 atomic percent tellurium, up to 1.0 atomic percent silver, and up to about 0.15 atomic percent tellurium iodide.

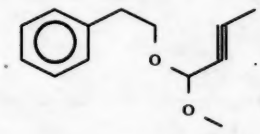
4,588,521

METHYL PHENETHYL ACETAL OF 2-BUTYNAL, PROCESS FOR PREPARING SAME AND ORGANOLEPTIC USES THEREOF

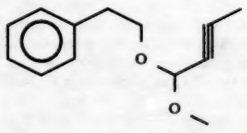
Richard M. Boden, Ocean, and Joseph A. McGhie, South Orange, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed May 11, 1984, Ser. No. 609,345
Int. Cl.[4] A61K 7/46; C11B 9/00
U.S. Cl. 252—522 R 18 Claims

1. A process for augmenting or enhancing the aroma of a consumable material selected from the group consisting of perfume compositions, perfumed articles and colognes comprising the step of adding to said consumable material an aroma augmenting or enhancing quantity of the compound having the structure:



5. A process for augmenting or enhancing the aroma of a consumable material selected from the group consisting of perfume compositions, perfumed articles and colognes comprising the step of adding to said consumable material an aroma augmenting or enhancing quantity of a mixture of compounds having the structures:



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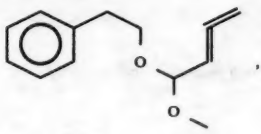
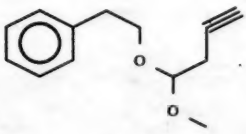
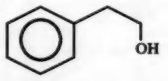


and



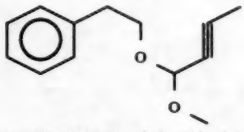
9. A process for augmenting or enhancing the aroma of a perfume composition, cologne or perfumed article comprising the step of intimately admixing with said perfume composition, cologne or perfumed article an aroma augmenting or enhancing quantity of a product produced according to a process comprising the step of intimately admixing the compound having the structure:

with beta-phenethyl alcohol having the structure:



wherein the mole ratio of compound having the structure:

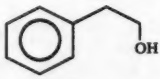
to beta-phenethyl alcohol is about 1:1 at a temperature in the range of from about 100 up to about 150° C. at about 1 atmosphere pressure whereby a composition of matter containing a substantial amount of compound having the structure:



is formed, the reaction being carried out in the presence of an alkali metal hydride, the reaction product being recovered by means of fractional distillation at a temperature in the range of from 128° C. up to 136° C. and at a pressure of from 3.5 mm/Hg pressure up to 3.8 mm/Hg pressure.

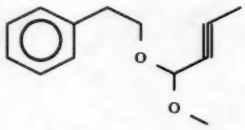
10. A process for augmenting or enhancing the aroma of a perfume composition, cologne or perfumed article comprising the step of intimately admixing with said perfume composition, cologne or perfumed article an aroma augmenting or enhancing quantity of a product produced according to a process comprising the step of intimately admixing the compound having the structure:

with beta-phenethyl alcohol having the structure:



wherein the mole ratio of compound having the structure:

to beta-phenethyl alcohol is about 1:1 at a temperature in the range of from about 100 up to about 150° C. at about 1 atmosphere pressure whereby a composition of matter containing a substantial amount of compound having the structure:



is formed, the reaction being carried out in the presence of an alkali metal hydride, the reaction product being recovered by means of fractional distillation at a temperature in the range of from 84° C. up to 96° C. at 2.2–2.4 mm/Hg pressure.

4,588,522

BETAINE-AMINE OXIDES, A PROCESS FOR THEIR PREPARATION AND THEIR USE AS SURFACTANTS

Günter Blaschke, Winhöring; Alwin Reng, Kelkheim, and Jochen M. Quack, Eppstein, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

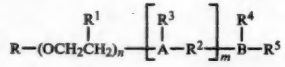
Filed Apr. 13, 1983, Ser. No. 484,528

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1982, 3215451

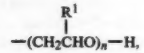
Int. Cl.[4] C11D *1/42, 1/18;* **C07C** *135/02, 101/24*

U.S. Cl. 252—547 **5 Claims**

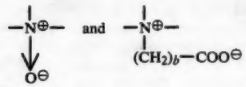
1. A betaine-amine oxide of the formula



in which R denotes alkyl, alkenyl or hydroxyalkyl, each of which has 8–22, carbon atoms, R^1 denotes hydrogen or methyl, R^2 denotes ethylene, propylene or 2-hydroxypropylene, R^3, R^4 and R^5 can be identical or different and denote C_1–C_3-alkyl or a group of the formula



and R^3 also denotes the group of the formula $—R^2—BR^4R^5$, A and B denote a group of the formulae



it being necessary for at least one amine oxide group and at least one betaine group to be present, b denotes 1, 2 or 3, n denotes a number from 0 to 10 and m denotes 1, 2 or 3.

4,588,523

INTUMESCENT FIRE RETARDANT COMPOSITIONS

Irving Tashlick, Long Branch, and Philip F. Valenziano, Old Bridge, both of N.J., assignors to Alva-Tech, Inc., Asbury Park, N.J.

Filed May 29, 1984, Ser. No. 614,750

Int. Cl.[4] C09K *21/00;* **A62D** *5/00;* **A62C** *3/16*

U.S. Cl. 252—606 **16 Claims**

1. A solid, heat expandable, fire retardant composition capable of expanding to more than 2 times its original volume when heated to about 175° C. and to at least 4.5 its original volume when heated to about 350° C., and having increased insulating and sealing efficiency at said elevated temperatures, said composition consisting essentially of about 15 to about 40 percent by weight of an unfoamed polyurethane resin binder, about 15 to 80 percent by weight of an intumescent granular hydrated alkali metal silicate, up to about 40 percent by weight of one or more char-forming components, and up to about 50 percent by weight of fillers, fire retardants, plasticizers, and reinforcing agents, said unfoamed polyurethane resin being formed by the reaction of an hydroxy-terminated poly(butadiene) and an isocyanate having at least two isocyanate groups per molecule.

4,588,524

MACHINE FOR COMPACTING FUEL ASSEMBLIES

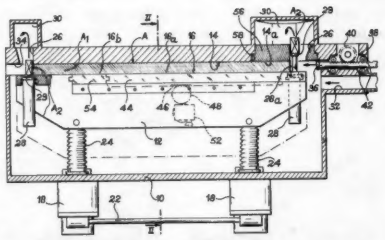
Pierre Auchapt; Robert Sablier; José Symard, and Philippe Seyfried, all of Bagnols Sur Ceze, France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed May 16, 1983, Ser. No. 494,927

Claims priority, application France, May 18, 1982, 82 08700

Int. Cl.[4] G21F *9/34*

U.S. Cl. 252—626 **4 Claims**



1. A machine for compacting fuel assemblies, constituted by protective structures containing the fuel and carrying caps at their ends, and for separating the caps from said structures, comprising a frame forming a lateral bearing surface, a compacting slide block forming a lateral bearing surface facing said first-mentioned bearing surface, a feed opening formed in the frame for introducing an assembly between said surfaces, means for displacing the slide block in a direction perpendicular to said surfaces, two cutting members carried by the slide block and respectively facing two discharge openings for said caps formed in said frame at the ends of the bearing surface formed thereon, means for displacing said cutting members in said direction in order to separate said caps from said struc-

tures, and means for discharging a compacted structure so produced through a discharge opening for said compacted structure formed in said frame.

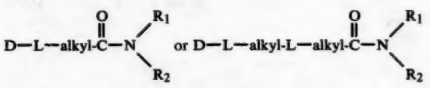
4,588,525

PRODRUG COMPOUNDS FOR DERMAL APPLICATION

Lyle J. Arnold, Jr., and Jerome A. Streifel, both of San Diego, Calif., assignors to Molecular Biosystems, Inc., San Diego, Calif.

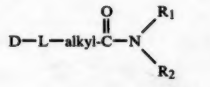
Filed Feb. 27, 1984, Ser. No. 584,113
Int. Cl.[4] C07J 5/00
U.S. Cl. 260—397.4 **12 Claims**

1. Prodrug compounds for dermal application represented by the following formulae:

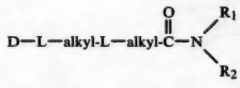


wherein D is 6-aminonicotinamide and L is an amide group, said alkyl groups containing from 1 to 5 carbons, said C, O and N representing respectively carbon, oxygen and nitrogen, and R_1 and R_2 are selected from (i) alkyl groups of 1 to 6 carbons, (ii) hydrogen when the other of the R group is alkyl, or (iii) combined to form a heterocyclic ring with the N contained therein and including 3 to 5 carbons.

12. Prodrug compounds for dermal application represented by the following formulae:



or



wherein D is a topical drug selected from the group consisting of 6-aminonicotinamide for which L is an amide, retinoic acid for which L is an ester group, and 17α-hydroxyprogesterone for which L is an ester group, said alkyl groups containing from 1 to 5 carbons, said C, O and N representing respectively carbon, oxygen and nitrogen, and R_1 and R_2 are selected from (i) alkyl groups of 1 to 6 carbons, (ii) hydrogen when the other of the R group is alkyl, or (iii) combined to form a heterocyclic ring with the N contained therein and including 3 to 5 carbons.

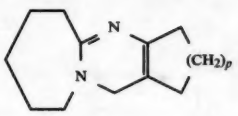
4,588,526

BRONCHODILATORY AZEPINO(1,2-A)PYRIMIDINE DERIVATIVES AND ACID ADDITION SALTS THEREOF AND BRONCHODILATING PHARMACEUTICAL COMPOSITIONS CONTAINING SAME

István Hermecz; Lelle Vasvári née Debreczy; Ágnes Horváth, all of Budapest; József Kökösi, Budaors; Sándor Virág, and Tibor Breining, both of Budapest, all of Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt, Budapest, Hungary

Filed Nov. 10, 1983, Ser. No. 550,937
Claims priority, application Hungary, Nov. 16, 1982, 3671/82
Int. Cl.[4] C07D 487/04; A61K 31/505
U.S. Cl. 260—243.3 **7 Claims**

1. A compound of the formula



wherein p is 1 or 2 or pharmaceutically acceptable acid addition salt thereof.

7. A bronchodilating method of treatment which comprises the step of administering to an animal subject in need of bronchodilation, a pharmaceutically effective amount of the compound of the Formula (I) defined in claim 1 or a pharmaceutically acceptable acid addition salt thereof.

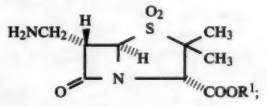
4,588,527

PROCESS FOR PREPARING PENICILLANIC ACID 1,1-DIOXIDE DERIVATIVES

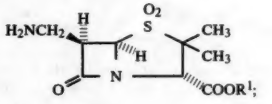
Donald K. Pirie, Uncasville; Robert A. Volkmann, Ledyard, and Edward F. Kleinman, Groton, all of Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 501,475, Jun. 6, 1983, Pat. No. 4,499,017.
This application Dec. 3, 1984, Ser. No. 677,611
Int. Cl.[4] C07D 499/00; A61K 31/425
U.S. Cl. 260—245.2 R **11 Claims**

1. A process for the preparation of
(a) a compound of the formula



(b) a compound of the formula



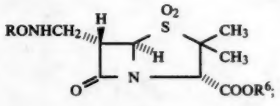
or

(c) a mixture of the compounds of the formulae (VI) and (VII);

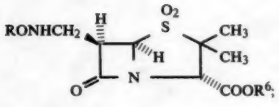
wherein in said formulae (VI) and (VII) R^1 is hydrogen or a conventional ester forming radical which is hydrolyzable under physiological conditions; which comprises hydrogenation over a Raney nickel catalyst of:

(A) when R^1 is hydrogen, respectively,

(a) a compound of the formula

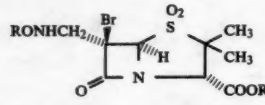


(b) a compound of the formula



or

(c) a mixture of the compounds of the formulae (VIII) and (IX), or a compound of the formula

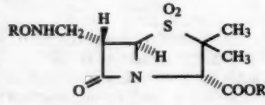


(X)

wherein in said formulae (VIII), (IX) and (X) R is (C_1–C_4) alkyl or benzyl and R^6 is hydrogen or a conventional carboxy protecting group removable by hydrogenolysis; or

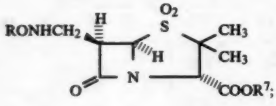
(B) when R^1 is said ester forming radical which is hydrolyzable under physiological conditions, respectively,

(a) a compound of the formula



(XI)

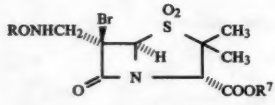
(b) a compound of the formula



(XII)

or

(c) a mixture of the compounds of the formulae (XI) and (XII), or a compound of the formula



(XIII)

wherein in said formulae (XI), (XII) and (XIII) R is as defined above and R^7 is a conventional ester forming radical which is hydrolyzable under physiological conditions.

4,588,528

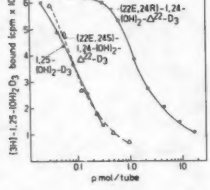
1,24-DIHYDROXY-Δ^{22}-VITAMIN D_3 AND PROCESS FOR PREPARING SAME

Hector F. DeLuca, Madison, Wis.; Nobuo Ikekawa, Tokyo, Japan, and Yoko Tanaka, Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

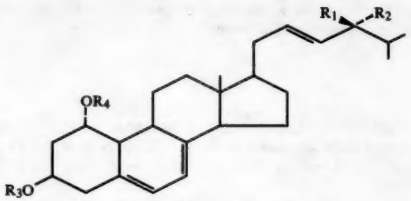
Filed May 31, 1984, Ser. No. 615,974

Int. Cl.[4] C07J 7/00

U.S. Cl. 260—397.2 **3 Claims**



1. Compounds having the formula



wherein

R_1 and R_2 are hydrogen or hydroxyl except that when R_1 is hydrogen R_2 is hydroxyl and when R_1 is hydroxyl R_2 is hydrogen; and

R_3 and R_4 are hydrogen or acyl having from 1 to 4 carbon atoms.

4,588,529

MERCURY REMOVAL PROCESS

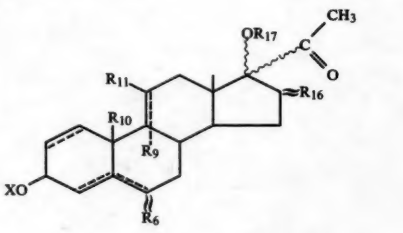
Dae Y. Cha, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Feb. 28, 1985, Ser. No. 706,586

Int. Cl.[4] C07J 5/00

U.S. Cl. 260—397.4 **15 Claims**

1. A process for removing mercury from a mercury contaminated steroid of the formula



I

and C_3 protected forms thereof, where X is a hydrogen atom or nothing, when X is nothing, the ≡ at C_3 is a double bond, when X is a hydrogen atom the ≡ at C_3 is a single bond; R_6 is a hydrogen, chlorine, fluorine or bromine atom, methyl or methylene group; R_9 is nothing, a hydrogen, chlorine, fluorine, bromine or oxygen atom which makes the C-ring

(a) $\Delta^{9(11)}$ when R_9 is nothing,

(b) 9β,11β-epoxide when R_9 and R_{11} taken together are oxygen atom;

R_{10} is a hydrogen atom or methyl group; R_{11} is a hydrogen, chlorine, bromine, fluorine or oxygen atom, two hydrogen atoms or α- or β-hydroxyl group which makes the C-ring

(a) $\Delta^{9(11)}$ when R_{11} is a hydrogen atom,

(b) 9β,11β-epoxide when R_9 and R_{11} taken together are oxygen atom and ≡ between C_{11} and R_{11} is a single bond;

R_{16} is a hydrogen atom, methyl or methylene, an ≈ is an α or β single bond when R_{16} is methyl or a double bond when R_{16} is methylene; R_{17} is a hydrogen atom, methyl, ethyl, formyl or acetyl which comprises dissolving the product in a solvent selected from the group consisting of methylene chloride, acetone or DMF; adding (1) a metal powder selected from the group consisting of zinc, copper or iron and (2) an acid selected from the group consisting of aliphatic (C_1–C_4) carboxylic acid, sulfuric acid or hydrochloric acid; and removing the mercury-metal amalgam.

4,588,530

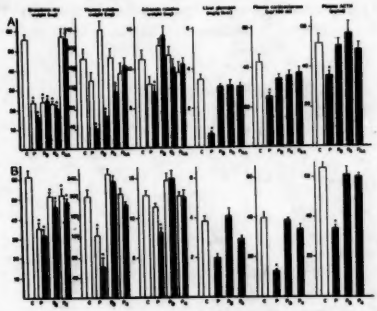
ANTI-INFLAMMATORY PREDNISOLONE STEROIDS

Henry J. Lee, Tallahassee, Fla., assignor to Florida Agricultural and Mechanical University, Tallahassee, Fla.

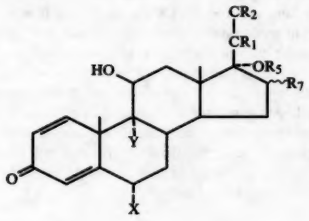
Continuation-in-part of Ser. No. 403,710, Jul. 30, 1982, abandoned. This application Jun. 9, 1983, Ser. No. 502,449

Int. Cl.[4] C07J 7/00

U.S. Cl. 260—397.45 10 Claims



1. Derivatives of prednisolone of the formula



wherein

CR_1 is C═O, α-HCOH; β-HCOH, or a mixture of α-HCOH and β-HCOH;

CR_2 is $HC(OH)OR_6$ when CR_1 is C═O;

CR_2 is $CONHR_4$ when CR_1 is α-HCOH, β-HCOH, or a mixture of α-HCOH and β-HCOH;

R_3 is alkyl of 1–5 carbon atoms;

R_4 is alkyl of 1–5 carbon atoms, benzyl, or phenethyl;

R_6 is alkyl of 1–5 carbon atoms;

R_7 is α- or β-position of hydrogen, hydroxyl, methyl, acetate ester of 1–5 carbon atoms, or alkoxy of 1–5 carbon atoms; and

X and Y are hydrogen, halogen, or methyl.

4,588,531

PREPARATION OF ALKALI METAL AND ALKALINE EARTH METAL SALTS OF ACYLOXYBENZENESULFONIC ACIDS

Wolf-Dieter Balzer, Ludwigshafen; Hans-Heinrich Bechtolsheimer, Dittelsheim-Hessloch; Karl-Heinz Beyer, Frankenthal; Rolf Fikentscher, Ludwigshafen; Johannes Perner, Neustadt; Rudi Widder, Leimen, and Helmut Wolf, Hassloch, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

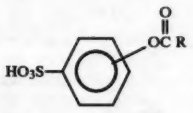
Filed Oct. 18, 1984, Ser. No. 662,048

Claims priority, application Fed. Rep. of Germany, Oct. 19, 1983, 3337921

Int. Cl.[4] C07C 143/90, 79/46, 69/76

U.S. Cl. 260—402 5 Claims

1. A process for the preparation of an alkali metal or alkaline earth metal salt of an acyloxybenzenesulfonic acid of formula I:



wherein R is a saturated or unsaturated alkyl radical of 1 to 17 carbon atoms, phenyl or phenyl monosubstituted or disubstituted by an alkyl radical of 1 to 3 carbon atoms, halogen, methoxy or nitro, comprising:

simultaneously adding liquid acyloxybenzenesulfonic acid and a 5–50% strength by weight aqueous solution of an alkali metal or alkaline earth metal hydroxide, carbonate or bicarbonate into water at a temperature of from 0° to 60° C.; and mixing the added ingredients during the addition process such that the acyloxybenzenesulfonic acid is neutralized with the pH of the water medium being maintained from 2.5 to 7.0, thereby forming an aqueous solution having an acyloxybenzenesulfonate salt concentration of 20–60% by weight.

4,588,532

PREPARATION OF PARA-ACYLOXYBENZENE SULFONATES

José Moyne, Caluire, and Camille Disdier, Lyons, both of France, assignors to Rhone-Poulenc Chimie de Base, Courbevoie, France

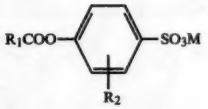
Filed Feb. 19, 1985, Ser. No. 702,733

Claims priority, application France, Feb. 17, 1984, 84 02398

Int. Cl.[4] C07C 143/46, 143/38

U.S. Cl. 260—402 23 Claims

1. A process for the preparation of a para-acyloxybenzene sulfonate having the general formula (I):



wherein R_1 is a straight or branched chain aliphatic radical having from 6 to 11 carbon atoms, R_2 is hydrogen, halogen, an alkyl radical having from 1 to 4 carbon atoms, or the radical $—SO_3M$, and M is an alkali or alkaline earth metal, or ammonium, which process comprises acylating an alkali or alkaline earth metal, or ammonium p-phenol sulfonate, with an anhydride of a straight or branched chain carboxylic acid having from 7 to 12 carbon atoms, in a polar aprotic solvent and in the presence of a catalytically effective amount of an organic sulfonic acid.

4,588,533

METHOD OF PREPARING ACYLOXYBENZENESULFONIC ACIDS AND SALTS THEREOF

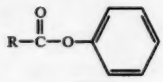
C. Bernard Berry, Jr., Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed May 18, 1984, Ser. No. 611,744

Int. Cl.[4] C07C 143/525

U.S. Cl. 260—402 20 Claims

1. A process for making an acyloxybenzene sulfonic acid, said process comprising reacting an aryl ester of an organic acid said ester having the formula:



wherein R is a hydrocarbon radical containing up to 30 carbon atoms and is selected from the group consisting of alkyl, alkenyl, cycloalkyl, aryl, arylalkyl and alkaryl with sulfur trioxide to form said acyloxybenzene sulfonic acid.

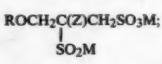
4,588,534

CHEMICAL COMPOSITION

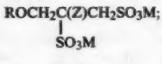
Lawrence H. Shepherd, Jr.; William J. DeWitt, and Gerhard O. Kuehnhanss, all of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Oct. 29, 1980, Ser. No. 202,008
Int. Cl.⁴ C07C *143/02*; C09K *3/00*
U.S. Cl. 260—513 R **10 Claims**

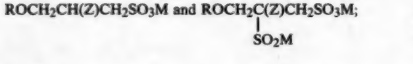
1. The compositions



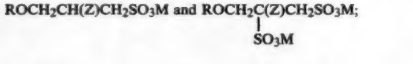
or



or a mixture of



or a mixture of



wherein
R is a hydrocarbon group having from about 6 to about 24 carbon atoms,
Z is hydrogen or a methyl group,
M is an alkali metal, alkylammonium or ammonium cation.

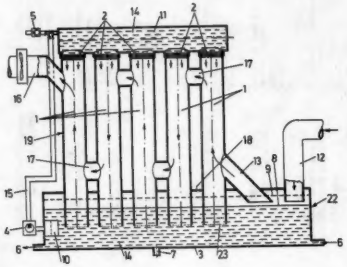
4,588,535

INSTALLATION FOR THE TREATMENT OF COMBUSTION GASES

Leonhard Foidl, Hochfügener Strasse 258, A-6263 Fügen, Austria

PCT No. PCT/AT84/00012, § 371 Date Nov. 30, 1984, § 102(e) Date Nov. 30, 1984, PCT Pub. No. WO84/03843, PCT Pub. Date Oct. 11, 1984
PCT Filed Mar. 14, 1984, Ser. No. 686,257
Claims priority, application Austria, Apr. 1, 1983, 1167/83
Int. Cl.⁴ B01F *3/04*
U.S. Cl. 261—22 **5 Claims**

1. Device for treating combustion gases from combustion units, comprising a vessel having an upper part, a middle part and a lower part, a supply duct at one side of the vessel for the combustion gases, an exhaust duct at an opposing side to said one side for the treated combustion gases, a flow path for the combustion gases in the middle part of the vessel extending from the supply duct at said one side to the exhaust duct at said opposing side, means providing washing liquid at two different filling levels in the lower part of the vessel, with the end of the supply duct being dipped into the washing liquid if the liquid is at its maximum filling level and being spaced therefrom if the liquid is at its minimum filling level, and downwardly directed spray nozzles in the upper part of the vessel, with the washing liquid discharged through the nozzles crossing the flow path of the combustion gases, characterized in that in the middle part of the vessel, at least one vertical duct is provided in the flow path, with the cross-sectional area at the upper end of said at least one vertical duct being completely filled with spray nozzles, the spray nozzles comprising a plurality of small diameter flow tubes extending in parallel adjacent each other and each



having a flow length to diameter ratio of 5:1 to 10:1, that above said at least one vertical duct a storage space is provided into which said at least one vertical duct opens and which has a volume corresponding to at least the liquid volume between the two filling levels in the lower part of the vessel, and that between the lower part of the vessel and the storage space a connecting line is provided including a circulating pump, with the delivery of the pump per unit time being at least equal to the total amount of liquid flowing through all of the spray nozzles when the storage space is completely filled.

4,588,536

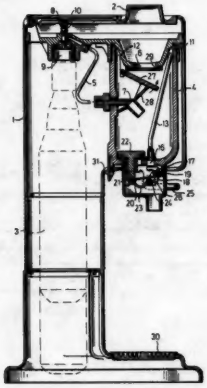
APPARATUS FOR SUPPLING GAS TO A LIQUID IN A CONTAINER

Bengt O. Adolfsson, Stockholm, Sweden, assignor to Kommanditbolaget Aldolf, Västerås, Sweden

PCT No. PCT/SE83/00261, § 371 Date Mar. 9, 1984, § 102(e) Date Mar. 9, 1984, PCT Pub. No. WO84/00352, PCT Pub. Date Feb. 2, 1984
PCT Filed Jun. 23, 1983, Ser. No. 598,148
Claims priority, application Sweden, Jul. 16, 1982, 82043688
Int. Cl.⁴ B67D *1/04*
U.S. Cl. 261—121 R **12 Claims**

1. An apparatus for supplying gas to a liquid in a container (4) having a gas conduit (5) discharging thereinto, said container having arranged in its upper portion a normally open filling orifice (6) through which liquid is introduced into said container, characterized by: normally open closure means (27) disposed proximate but spaced from said orifice and movable in a direction to close said orifice, said closure means being

normally biased away from the orifice, and means for automatically initiating movement of the closure means in said direc-



tion to close the orifice in response to the supplying of gas to the container.

4,588,537

METHOD FOR MANUFACTURING AN ELECTRET FILTER MEDIUM

Petrus T. A. Klaase, Voorburg, and Jan van Turnhout, Pijnacker, both of Netherlands, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

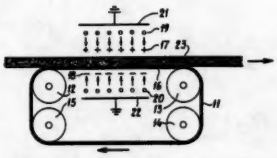
PCT No. PCT/US84/00149, § 371 Date Feb. 2, 1984, § 102(e) Date Oct. 4, 1984, PCT Pub. No. WO84/03193, PCT Pub. Date Aug. 16, 1984

PCT Filed Feb. 2, 1984, Ser. No. 661,365

Claims priority, application Netherlands, Feb. 4, 1983, 8300437; Feb. 4, 1983, 8300439

Int. Cl.[4] B29C *71/04*

U.S. Cl. 264—22 **21 Claims**



1. A method for manufacturing an electret filter medium from a dielectric material with an open or porous structure, comprising the steps of:

continuously feeding a web of said dielectric material with a substantially closed non-fibrous dielectric foil adjacent to at least one major face thereof into a corona discharge device;

reducing the thickness of said web of dielectric material to achieve upon charging a web of superior filtration efficiency; and

charging said web of reduced thickness dielectric material by means of a corona discharge.

4,588,538

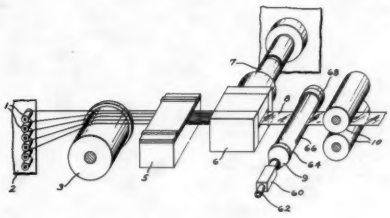
PROCESS FOR PREPARING TAPES FROM THERMOPLASTIC POLYMERS AND CARBON FIBERS

Tai-Shung Chung, Summit; Howard Furst, Berkeley Heights, both of N.J.; Zev Gurion, Charlotte, N.C.; Paul E. McMahon; Richard D. Orwoll, both of Mountainside, N.J., and Daniel Palangio, Woodbridge, N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Mar. 15, 1984, Ser. No. 589,816

Int. Cl.[4] B29C *47/02*

U.S. Cl. 264—29.2 **15 Claims**



1. A process for preparing tapes from thermoplastic polymers and carbon fibers which comprises:

(a) spreading a tow of carbon fibers to provide substantially complete wetting of the carbon fibers when impregnated in a crosshead die;

(b) feeding the tow into a crosshead die;

(c) impregnating the tow in the crosshead die under pressure with a thermoplastic polymer to form a tape;

(d) withdrawing the tape from the die; and immediately thereafter;

(e) cooling the tape with a jet of gas.

4,588,539

PROCESS AND PRESS WITH A CONTROLLED PRESSURE SYSTEM

Alfred F. Rossi, Wyckoff; Albert D. Johns, Roselle Park; Walter Malakhow, Teaneck, all of N.J., and George W. Michalec, Pleasantville, N.Y., assignors to James River Corporation of Virginia, Norwalk, Conn.

Filed Feb. 4, 1985, Ser. No. 697,888

Int. Cl.[4] B29C *17/00*

U.S. Cl. 264—40.5 **26 Claims**

1. A press for forming sheet material into a shaped article, said press comprising;

(a) a frame;

(b) first and second complementary dies;

(c) cam means supported by said frame for reciprocally moving said first die along an axis between a first position axially spaced from said second die and a second position fully mated with said second die, said cam means including a dwell period when said first die is in said second position;

(d) bolster means supporting said second die for axial movement between upper and lower limits, said bolster means being axially displaceable from said upper limit by movement of said first die to its second position;

(e) hydraulically actuated power means for biasing said bolster means towards said upper limit;

(f) control means responsive to the position of said cam means for normally conducting hydraulic fluid to said power means under a first pressure and for conducting hydraulic fluid to said power means under a second pressure during said dwell period, said second pressure being greater than said first pressure; and

(g) means for selectively adjusting the magnitude of said first and second pressures.

10. A method of forming a shaped article for sheet material, said method comprising:

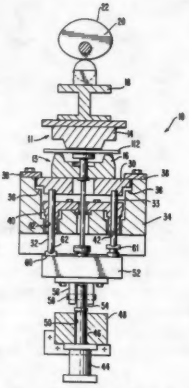
(a) providing a first die for reciprocal axial movement between first and second positions;

(b) providing a second die, complementary and axially opposed to said first die for axial movement between upper and lower limits;

(c) normally applying a first predetermined pressure to said second die to bias said second die towards said upper limits;

(d) disposing said sheet material between said first and second dies;

(e) axially moving said first die from said first position



spaced from said second die to said second position mated with said second die by a force sufficient to axially move said second die from its upper limit when said first die achieves its second position;

(f) maintaining said first die in said second position for a predetermined period;

(g) while said first die is in said second position, applying a second predetermined hydraulic pressure to said second die to bias said second die toward said upper limit, said second pressure being greater than said first pressure;

(h) removing said second predetermined pressure and axially moving said first die from said second position to said first position; and

(i) removing said shaped article.

4,588,540

METHOD OF MANUFACTURING POROUS SINTERED INORGANIC BODIES WITH LARGE OPEN PORE VOLUME

Werner Kiefer, Mainz-Finthen, and Maria Sura, Ingelheim, both of Fed. Rep. of Germany, assignors to Schott Glaswerke, Mainz, Fed. Rep. of Germany

Filed Feb. 13, 1984, Ser. No. 579,539

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1983, 3305854

Int. Cl.⁴ B29C *67/04;* **C04B** *38/04;* **C03B** *19/06*

U.S. Cl. 264—43 **23 Claims**

1. A process for the manufacture of porous sintered bodies with large open pore volume and defined pore diamenter characterized in that a sinterable material in the form of finely ground powder is mixed with a leachable substance which exhibits a melting point higher than the sintering temperature of the sinterable mass, and wherein the leachable substance is in the form of powder of a defined particle size; the mixture of sinterable material and leachable substance is heated to the sintering temperature and maintained there until the sinterable mass is sintered; thereafter the sintered products are cooled and the leachable substance is leached from the sintered product at a temperature under the sintering temperature.

4,588,541

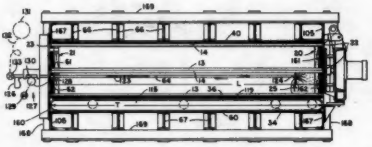
FILLING OF INSULATING MATERIAL INTO BUILDING PANELS

James A. Fowler, 2892 Areca Dr., Los Alamitos, Calif. 90720

Filed Nov. 14, 1984, Ser. No. 671,180

Int. Cl.⁴ B29C *67/22, 39/10, 43/12*

U.S. Cl. 264—45.2 **35 Claims**



1. The method that comprises:

positioning within a chamber in a press at least one hollow building panel having walls extending about a cavity or cavities in the panel;

inflating a flexible bladder at the outside of said panel and at the outer side of one of said walls;

filling a foamable insulating material into said cavity or cavities in the panel at the inner side of said one wall; and

restraining said one wall of the panel, by force exerted by said bladder, against deflection of said one wall outwardly by said foamable insulating material.

4,588,542

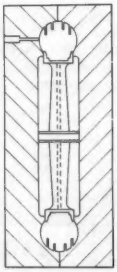
BICYCLE WHEEL ASSEMBLY

Owen A. Pierce, Novi, Mich., assignor to G. P. Plastics, Inc., Pontiac, Mich.

Filed May 4, 1981, Ser. No. 260,416

Int. Cl.⁴ B29C *67/22, 45/16*

U.S. Cl. 264—45.5 **2 Claims**



1. A process of manufacturing a bicycle wheel and tire assembly comprising the steps of:

inserting a bicycle wheel assembly comprising a central hub, a plurality of radically extending spokes joined to said hub at one end and a rim having a channular cross-section oriented away from the central hub joined to the outermost ends of said spokes into a mold cavity configured to form a bicycle tire around said rim; such that the channular rim defines one wall of the mold cavity;

injecting a foamable polyurethane composition into said mold cavity;

foaming and curing said polyurethane composition in said mold cavity causing said polyurethane composition to come into contact with the outer surfaces of said mold

cavity thereby forming a dense polymeric structure at the rim and outer edges and a lower density core; and

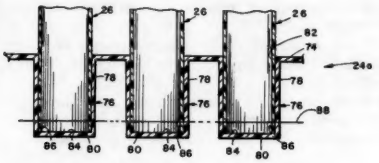
cooling said polyurethane composition to cause it to shrink fit about said rim to form a unitary tire and wheel assembly.

4,588,543

METHOD OF CONSTRUCTING HEAT EXCHANGER CORE

Fritz Huebner, Zeeland, Mich., assignor to Plascore, Inc., Zeeland, Mich.

Filed Sep. 13, 1982, Ser. No. 417,639
Int. Cl.⁴ B29C *65/18*
U.S. Cl. 264—248 **5 Claims**



1. A method of fabricating a heat exchanger core comprising:

providing an end plate with an end wall and a plurality of fusible tubular pockets extending from a common side of said end wall;

providing a plurality of fusible tubes;

inserting one of said tubes into each of said pockets; and

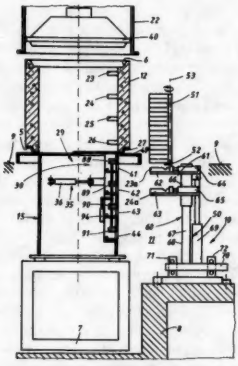
passing a hot element through each of said pockets and said tubes positioned therein to sever said pockets and to fuse said tubes and pockets together whereby said tubes are secured to and communicate through said end plate.

4,588,544

METHOD AND APPARATUS FOR FORMING CONCRETE ARTICLES CONTAINING ONE OR MORE PROJECTING ELEMENTS

Richard Kraiss, Laichingen-Suppingen, Fed. Rep. of Germany, assignor to Georg Prinzing GmbH & Co. KG Betonformen- and Maschinenfabrik, Blaubeuren, Fed. Rep. of Germany

Filed Feb. 28, 1985, Ser. No. 707,941
Claims priority, application Fed. Rep. of Germany, Feb. 28, 1984, 3407124; Jan. 22, 1985, 3501845
Int. Cl.⁴ B28B *1/00, 23/00*
U.S. Cl. 264—277 **81 Claims**



1. A method for molding concrete articles with one or more projecting elements, comprising the steps of: providing a mold core having a core segment and a remaining portion, the core segment having one or more housings corresponding to the one or more projecting elements, and said housings being movable relative to the remaining portion of said mold core into a release position and a closed position; providing a mold jacket relative to said mold core so as to form a mold cavity; starting a first work cycle by moving said core segment into the closed position, and bringing in and holding the one or more elements in said housings; pouring concrete into the mold cavity to form the article; completing the first work cycle after hardening of the concrete with the elements therein, by moving the core segment into the release position and removing the concrete article from said mold cavity; and automatically bringing projecting elements for a next work cycle into said housings of said core segment during a time interval between said first work cycle and said next work cycle and in timed overlap with the working steps which may occur during this time interval.

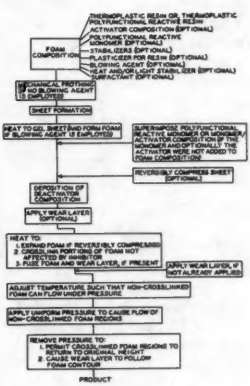
13. An apparatus for producing concrete articles with at least one projecting element, comprising: a molding arrangement having an inner mold core and an outer mold jacket, said mold core having a mounting fixture for cementing the projecting elements from the inside in the concrete article to be formed; and an automatically working element inserting mechanism located in a working area neighboring the molding arrangement, and oriented at least substantially to the height of said inner mold core for inserting the projecting elements into said inner mold core and thereby into the concrete article.

4,588,545

PROCESS OF FORMING AN EMBOSSED SURFACE COVERING HAVING A WEAR LAYER ATTACHED UNIFORMLY THERETO

William J. Kauffman, Penn Township, Lancaster County, and George L. Lilley, Rapho Township, Lancaster County, both of Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Aug. 24, 1981, Ser. No. 295,720
The portion of the term of this patent subsequent to May 24, 2000, has been disclaimed.
Int. Cl.⁴ B29C *39/20;* C08J *3/24, 9/30*
U.S. Cl. 264—46.4 **21 Claims**


THERMOPLASTIC RESIN OR, THERMOPLASTIC POLYFUNCTIONAL REACTIVE RESIN
ACTIVATOR COMPOSITION (OPTIONAL)
POLYFUNCTIONAL REACTIVE MONOMER (OPTIONAL)
FOAM COMPOSITION
STABILIZERS (OPTIONAL)
PLASTICIZER FOR RESIN (OPTIONAL)
BLOWING AGENT (OPTIONAL)
HEAT AND/OR LIGHT STABILIZER (OPTIONAL)
SURFACTANT (OPTIONAL)
MECHANICAL FROTHING NO BLOWING AGENT IS EMPLOYED
SHEET FORMATION
HEAT TO GEL SHEET AND FORM FOAM IF BLOWING AGENT IS EMPLOYED
SUPERIMPOSE POLYFUNCTIONAL REACTIVE MONOMER OR MONOMER/ACTIVATOR COMPOSITION IF THE MONOMER AND OPTIONALLY THE ACTIVATOR WERE NOT ADDED TO FOAM COMPOSITION
REVERSIBLY COMPRESS SHEET (OPTIONAL)
DEPOSITION OF REACTIVATOR COMPOSITION
APPLY WEAR LAYER (OPTIONAL)
HEAT TO:
1. EXPAND FOAM IF REVERSIBLY COMPRESSED
2. CROSS-LINK PORTIONS OF FOAM NOT AFFECTED BY INHIBITION
3. FUSE FOAM AND WEAR LAYER, IF PRESENT
APPLY WEAR LAYER, IF NOT ALREADY APPLIED
ADJUST TEMPERATURE SUCH THAT NON-CROSSLINKED FOAM CAN FLOW UNDER PRESSURE
APPLY UNIFORM PRESSURE TO CAUSE FLOW OF NON-CROSSLINKED FOAM REGIONS
REMOVE PRESSURE TO:
1. PERMIT CROSS-LINKED FOAM REGIONS TO RETURN TO ORIGINAL HEIGHT
2. CAUSE WEAR LAYER TO FOLLOW FOAM CONTOUR
PRODUCT

1. A process for forming embossed surface coverings from a cross-linkable foam containing an initiator on a backing, said process comprising the steps of:

forming a layer of said foam on said backing,

selectively depositing a cross-linking inhibitor on the foam suface,

applying a first wear layer coating over at least a portion of said foam surface,

heating the coated foam to fuse the foam and wear layer and effect cross-linking of the regions on which inhibitor has not been deposited,

adjusting the temperature of the cross-linked composite material at least to a temperature at which the noncross-linked foam will flow under pressure,

applying sufficient uniform pressure to said cross-linked composite material to compress it to a desired embossing depth, said pressure being not greater than that pressure which will compress said material to a density equal to the bulk density of the noncross-linked foam, and

removing the compressing force,

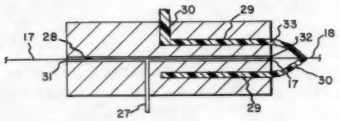
whereby noncross-linked regions are embossed whereas cross-linked regions substantially return to their original height.

4,588,546

WIRE COATING PROCESS

Joseph N. Feil, Akron, and John E. Hrivnak, Clinton, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Aug. 27, 1984, Ser. No. 644,187
Int. Cl.[4] B29C *47/02*
U.S. Cl. 264—510 **18 Claims**



1. A process for coating a wire with a thermoplastic composition to a desired thickness in a single pass comprising:

(1) preheating the wire to a temperature of about 150° C. to about 325° C.;

(2) passing the wire through a tubing type cross-head die which is at a temperature of about 255° C. to about 350° C.;

(3) extruding the thermoplastic composition into a tube which surrounds the wire which is exiting the tubing type cross-head die at a speed lower than that at which the wire is exiting the tubing type cross-head die; and

(4) applying a vacuum to the die cavity so as to cause the tube of thermoplastic composition to collapse onto the wire as it exits the tubing type cross-head die; wherein the thermoplastic composition is comprised of 95 to 98 weight percent PET and from 2 to 5 weight percent of at least one member selected from the group consisting of polyethylene and polypropylene.

4,588,547

METHOD AND APPARATUS FOR DETERMINING THE NEARNESS TO CRITICALITY OF A NUCLEAR REACTOR

Albert J. Impink, Jr., Murrysville, and Francis L. Langford, Jr., Forest Hills, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

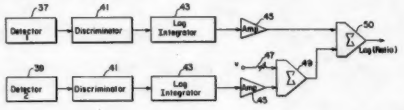
Filed Oct. 7, 1983, Ser. No. 540,073
Int. Cl.[4] G21C *17/00*
U.S. Cl. 376—254 **15 Claims**

8. Apparatus for determining the reactivity of reactor fuel in the core of a nuclear reactor, comprising:

an artificial source of neutrons implanted in the reactor fuel which generates a neutron flux only in a localized region;

a first neutron detector positioned to detect neutrons in the localized region from the artificial source and from the reactor fuel and to generate a first electrical signal representative of the neutron flux in said localized region;

a second neutron detector positioned in a similar relationship to reactor fuel in the reactor core as the first neutron detector but removed from said localized region to generate a second electrical signal representative of the neutron flux generated by the natural neutron sources in the reactor fuel but not the neutron flux generated by the artificial neutron source;



means for generating a ratio signal representative of the ratio of the second electrical signal to the first electrical signal; and

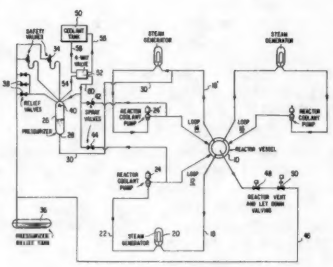
means for generating an output signal from the ratio signal representative of the reactivity of the reactor fuel in the reactor core as a function of the ratio signal.

4,588,548

PRESSURIZER PASSIVE STEAM RELIEF AND QUENCH SPRAY SYSTEM

Robert D. Magee, Monroeville; Michael J. Asztalos, Churchill, and Vuong D. Trinh, Monroeville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 19, 1984, Ser. No. 622,317
Int. Cl.[4] G21C *1/08*
U.S. Cl. 376—307 **10 Claims**



1. In a cooling system of the pressurized water type for a nuclear reactor including: a reactor pressure vessel; a plurality of primary liquid coolant circulation loops for said reactor pressure vessel with said loops being in communication within said reactor pressure vessel to form a closed primary reactor cooling system, and with each said loop including a hot leg and a cold leg leading respectively from and to said reactor pressure vessel, a steam generator having its input connected to the respective said hot leg and its output connected to the respective said cold leg, and a coolant pump connected in the respective said cold leg; a vertical pressurizer vessel which is partially filled with liquid coolant; a coolant connection from the lower end of said pressurizer vessel to said hot leg of one of said loops; a heater for heating the liquid coolant in the lower portion of said pressurizer vessel so as to produce a pressure in the upper portion of said pressurizer vessel, and hence in said primary cooling system, such that the coolant in said system does not boil; and means, connected to the upper end of said pressurizer vessel, for reducing the pressure in said pressure vessel; the improvement wherein said means for reducing the pressure in said pressurizer vessel comprises: a coolant spray nozzle in the upper end of said pressurizer vessel; a closed coolant tank disposed vertically above said pressurizer vessel

and containing liquid coolant which is subcooled at the pressure within said primary cooling system; a pressure outlet in the upper end of said pressurizer vessel; first and second coolant connections for said coolant tank, with said first coolant connection being at the bottom of said tank and said second coolant connection being near the top of said tank; and pressure responsive valve means, responsive to the pressure in said pressurizer vessel reaching a predetermined value, for connecting said first and second coolant connections to said nozzle and to said pressure outlet, respectively.

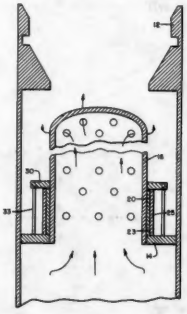
10. A pressurizer arrangement comprising in combination: a closed pressurizer vessel having a lower portion for containing water and an upper portion for containing steam; an opening in the bottom of said vessel for connecting said vessel to the primary water circuit of a heating or cooling installation; a heater in said lower portion of said vessel for heating the water in said vessel to produce steam; a water spray nozzle in the upper portion of said vessel; a closed water tank, partially filled with water, disposed vertically above said pressurizer vessel; and a normally closed four-way mechanical pressure relief valve means, which is responsive to the pressure in said vessel, and opens when reaching a predetermined value, for connecting the lower portion of said tank to said spray nozzle and the upper portion of said tank to the upper portion of said pressurizer vessel when said pressure in said vessel reaches a predetermined value, whereby the pressure in said vessel is reduced by water being sprayed into the upper end of said vessel via said nozzle to quench the steam, in said vessel and steam in said vessel expanding into said tank.

4,588,549

AUTOMATIC COOLANT FLOW CONTROL DEVICE FOR A NUCLEAR REACTOR ASSEMBLY

Ernest Hutter, Wilmette, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 27, 1984, Ser. No. 574,509
Int. Cl.[4] G21C *7/32, 15/04*
U.S. Cl. 376—352 **2 Claims**



1. For a nuclear reactor assembly through which coolant flows, a coolant flow control device comprising:

a substantially cylindrical baffle extending lengthwise over the coolant exit of said assembly, said baffle having cylindrical walls and a plurality of orifices therein for coolant flow; and

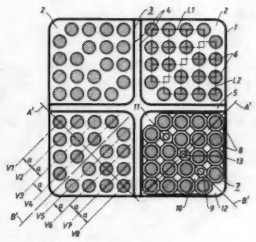
a cylindrical sleeve of lesser length than said cylindrical baffle, disposed coaxially outside in contact with a lengthwise portion of said baffle to block only a portion of said plurality of orifices, said sleeve including an outer layer of a first metallic material contiguous throughout its length with an inner layer of a second metallic material, said second metallic material of the inner layer having a higher thermal coefficient of expansion than said first metallic material of the outer layer, said sleeve further including a slit through said first and second layers along the entire length thereof to be capable of assuming a first position in contact along its entire length with substantially the full cylindrical circumference of the baffle at a first temperature and to be capable of assuming a second position in contact with less than substantially the full circumference of the cylindrical baffle leaving space therebetween at a second temperature higher than the first temperature wherein less of the plurality of orifices are blocked in the second than in the first position of the sleeve to achieve coolant flow control responsive to temperature.

4,588,550

FUEL ASSEMBLY FOR A BOILING WATER REACTOR

Jan Blomstrand; Anders Johansson; Sigvard Junkrans; Olov Nylund, and Aart van Santen, all of Västerås, Sweden, assignors to Aktiebolaget ASEA-ATOM, Västerås, Sweden

Filed Jun. 10, 1983, Ser. No. 503,123
Claims priority, application Sweden, Jul. 12, 1982, 8204269
Int. Cl.[4] G21C *3/32*
U.S. Cl. 376—438 **7 Claims**



1. In a boiling water reactor, a fuel assembly comprising a plurality of vertical fuel rods and a fuel channel made with four side walls and with substantially square cross-section, said fuel channel being arranged to surround said fuel rods, said fuel rods being divided, by means of a vertical water passage device of substantially cruciform cross-section, into four bundles of fuel rods, each bundle having a substantially rectangular cross-section and comprising a plurality of spacers arranged at different levels to position the fuel rods of the bundle at points of intersection with a transversal plane, wherein at least one of said bundles is made with only twenty fuel rod positions, each of said fuel rod positions being occupied by a fuel rod and the number of fuel rod positions in each of the remaining fuel rod bundles being at least sixteen and at most twenty-five, whereas said twenty fuel rod positions are mirror-symmetrically arranged in relation to a first vertical symmetry plane, four of said twenty fuel rod positions lying in said first symmetry plane, said twenty fuel rod positions being unevenly distributed among eight imaginary vertical planes which are oriented perpendicularly to said first symmetry plane, said twenty fuel rod positions being also mirror-symmetrically arranged in relation to a second vertical symmetry plane which is perpendicularly oriented with respect to said first symmetry plane, said first symmetry plane being substantially diagonally oriented with respect to said substantially rectangula. cross-section of the bundle, whereas ten of said twenty fuel rod positions coincide with nodes in a first square lattice and the remaining ten fuel rod positions coincide with nodes in a second square lattice.

4,588,551

ARTICLE HAVING CAST METAL PORTION AND SINTERED METALLIC PORTION AND METHOD OF PRODUCING SAME

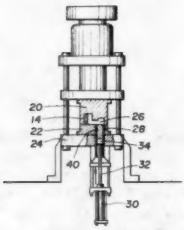
Takaaki Iijima, Fuji; Takeshi Nishiura, Numazu; Ryuji Inomata; Eiji Tanaka, both of Fuji, and Hideaki Suzuki, Numazu, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Dec. 5, 1984, Ser. No. 678,467

Claims priority, application Japan, Dec. 6, 1983, 58-229096

Int. Cl.[4] B22F *3/10*

U.S. Cl. 419—2 **13 Claims**



1. An article comprising:

a first portion which is formed porously by sintering of a metallic material: and

a second portion which is formed of a metal and intimately bonds to said first portion, said second portion being formed by molten metal forging with said first portion kept in contact with the molten metal such that the pores of said first portion at least in a region contiguous to the interface between said first portion and said second portion are filled with said metal of said second portion by infiltration of the molten metal under pressure during the molten metal forging process.

4,588,552

PROCESS FOR THE MANUFACTURE OF A WORKPIECE FROM A CREEP-RESISTANT ALLOY

Günther Schröder, Birmenstorf, and Robert Singer, Baden, both of Switzerland, assignors to BBC Brown, Boveri & Co., Ltd., Baden, Switzerland

Continuation of Ser. No. 413,840, Sep. 1, 1982, abandoned. This application Nov. 1, 1984, Ser. No. 666,147

Claims priority, application Switzerland, Sep. 3, 1981, 5693/81

Int. Cl.[4] B22F *1/00, 9/00*; C22C *1/04, 19/03*

U.S. Cl. 419—19 **9 Claims**

1. A process for the manufacture of a workpiece, having high creep strength at high temperatures, from a high-nickel alloy which contains a metal oxide as a hardening dispersoid, comprising the following steps:

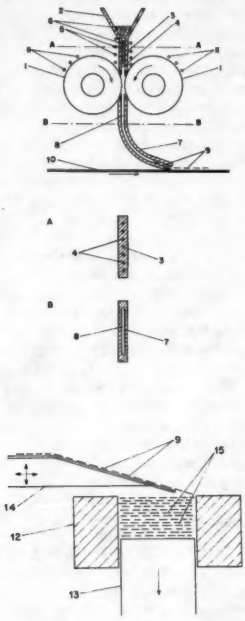
(a) preparing randomly shaped particles of a mechanically alloyed, dispersoid containing metal powder comprising a metallic alloy and a metal oxide dispersoid by bonding metallic powders and fine metallic oxide particles through a mechanical alloying process,

(b) subjecting said particles of mechanically alloyed metal powder to a hot or warm rolling process, effecting non-work hardening deformation, thereby deforming said randomly shaped particles into elongated flaked shapes such that the original volume of the particles increases by no more than a factor of 5.0 and the degree of deformation, ϵ, is greater than 0.1, where

$$\epsilon = |\ln(h_f/h_o)|,$$

in which h_o, denotes the mean particle diameter before the rolling operation and h_f denotes the mean particle thickness after the rolling operation, and wherein the deformation rate

$$\dot{\epsilon} = d\epsilon/dt$$



is maintained within the limits such that

$$10^{15}(m^{-2}) < \dot{\epsilon}/D < 10^{20}(m^{-2})$$

ϵ being defined as

$$\dot{\epsilon} = \frac{v_r}{\sqrt{R \times h_o}} \times \sqrt{r}\left(1 + \frac{r}{4}\right),$$

$$\text{wherein } r = \frac{h_o - h_f}{h_o}$$

$v = 2\pi R\nu$ = Peripheral speed of the rolls, in m/s

R = radius of the rolls, in m

ν = rotation speed of the rolls, in revolutions per second

and D is the diffusion coefficient, represented by the equation

$$D = 1.5 \times 10^{-4} \exp\left(-\frac{3.4 \times 10^4}{T}\right) \text{ m}^2/\text{s},$$

T = Temperature, in Kelvin

m = unit of length, in meters

s = unit of time, in seconds

(c) encapsulating the resulting metal powder flakes in a metal container, and

(d) subjecting said metal powder flakes to thermal-mechanical temperature by an isostatic hot-pressing operation, and then

(e) immediately subjecting said treated metal powder flakes

to an annealing thermal treatment operation to obtain the finished coarse grained workpiece.

4,588,553

ALUMINIUM ALLOYS

Brian Evans, Aldershot, and Christopher J. Peel, Fleet, both of England, assignors to The Secretary of State for Defence in Her Brittanic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Feb. 22, 1983, Ser. No. 468,592

Claims priority, application United Kingdom, Feb. 26, 1982, 8205746; Mar. 26, 1982, 8209010

Int. Cl.⁴ C22C *21/16*

U.S. Cl. 420—533 **10 Claims**

1. An aluminium based alloy consisting essentially of in weight percent;

Lithium	2.0 to 2.8
Magnesium	0.4 to 1.0
Copper	1.0 to 1.5
Zirconium	0 to 0.2
Manganese	0 to 0.5
Nickel	0 to 0.5
Chromium	0 to 0.5
Aluminium	Balance (except for incidental impurities).

4,588,554

REAGENT PACKAGE

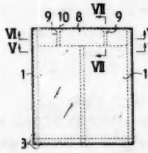
Niilo Kaartinen, Kuusisto, and Henrik Johansson, Espoo, both of Finland, assignors to Fluilogic Systems Oy, Finland

Continuation of Ser. No. 468,948, Feb. 23, 1983, abandoned. This application Feb. 4, 1985, Ser. No. 697,700

Claims priority, application Finland, Feb. 25, 1982, 820656

Int. Cl.⁴ B01L *3/00*; B65D *30/22, 33/16, 33/36*

U.S. Cl. 422—61 **9 Claims**



1. A reagent package comprising:

means defining at least one set of plural adjacent gas-tight chambers wherein each chamber has an interior and contains a reagent for an analysis, said means defining at least one set of chambers comprising two opposed walls and at least one bar-like member having a plurality of transversal passages defined therein, the number of said bar-like members being equal to the number of chamber sets and each set of chambers having only one bar-like member corresponding thereto, wherein each wall comprises a metallic, gas impermeable foil and wherein at least one wall is flexible so that each chamber is capable of being flattened when emptied, each chamber having a perimeter with a portion of its perimeter being defined by a seam formed by seaming said two opposed walls together and the remaining portion of its perimeter being defined by a said bar-like member that has been seamed between said two opposed walls along an edge of the package in such a manner that each of its transversal passages corresponds to and extends into the interior of only one chamber in its corresponding set of chambers and each member of its corresponding set of chambers has a transversal passage extending therein, and wherein said passages are hermetically sealed and are capable of being opened for discharging the reagents from the chambers through at least one discharging means that has been connected to the package by a gas-tight connection.

4,588,555

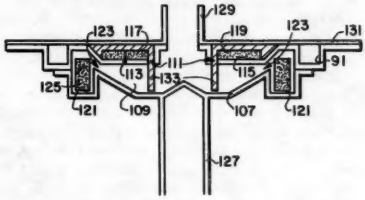
DEVICE FOR USE IN CHEMICAL REACTIONS AND ANALYSES

Richard B. Provonchee, Camden, Me., assignor to FMC Corporation, Philadelphia, Pa.

Filed Oct. 4, 1982, Ser. No. 432,506

Int. Cl.⁴ G01N *21/07, 33/52, 35/00*

U.S. Cl. 422—72 **3 Claims**



1. A device for use in liquid chemical reactions comprising a disc adapted to be rotated about its axis, containing

(i) a mixing cuvette, within which an assay medium and at least one reagent-containing liquid may be mixed for chemical reaction;

(ii) a solid microporous element located between the cuvette and the disc axis and having walls defining an internal cell structure with interconnecting cells, at least some of which open along exposed surfaces of the element;

(iii) a precise measured quantity of reagent contained within the cell structure of the microporous element, the reagent being in solid form yet capable of being solubilized or dispersed in a liquid to form said reagent containing liquid and the element being formed of a materiaI that is inert and adsorbent with respect to the reagent and that is wettable by the said reragent-containing liquid;

(iv) a first liquid delivery means for facilitating flow of said reagent-containing liquid from the microporous element to the cuvette, by the action of centrifugal force on said reagent-containing liquid in the element upon rapid rotation of the disc in at least one direction about its axis; and

(v) a second liquid delivery means, consisting of a chamber in the disc for containing a liquid and a wick extending from said microporous element and into said chamber, for delivery of said liquid from the chamber into the element and into contact with the reagent by capillarity or wicking for forming said reagent-containing liquid, the chamber being at a location in the disc remote from the cuvette.

2. In a centrifugal chemical analyzer including a rotor disc having a mixing cuvette within which an assay medium and at least one liquid reagent are mixed together for chemical reaction upon rotation of the rotor disc about its axis, means for rotating the disc about its axis, means for detecting the chemical reaction between the assay medium and the liquid reagent, and means for presenting the reaction data,

the improvement in the rotor disc which comprises

(i) a well in the rotor disc at a location between the disc axis and the mixing cuvette;

(ii) a solid microporous element contained within the well and having walls which define an internal cell structure with interconnecting cells, at least some of which open along exposed surfaces of the element;

(iii) a precise measured quantity of reagent contained within the cell structure of the microporous element, the reagent being in solid form yet capable of being solubilized or dispersed in an aqueous liquid to form a reagent-containing liquid;

(iv) a first delivery means for facilitating delivery of said reagent-containing liquid from the microporous element into the cuvette via propulsion under the influence of centrifugal force during rotation of the rotor disc in at least one direction about its axis, and

(v) a second delivery means, for delivering an aqueous liquid into the well for dissolving or dispersing reagent in the element and thereby forming said reagent-containing liquid said second delivery means consisting of a chamher in the rotor disc, a wick extending from the microporous element and into the chamber for delivery of an aqueous liquid from the chamber into the element and into contact with the reagent by capillarity, an annular pocket formed adjacent to and communicating with the outer periphery of the chamber for receiving excess liquid from the chamber by centrifugal force upon rotation of the rotor disc in one direction about its axis, and a ring formed of porous solid material for containing the excess liquid received within the annular pocket.

3. In a centrifugal chemical analyzer including a rotor disc having a mixing cuvette within which an assay medium and at least one liquid reagent are mixed together for chemical reaction upon rotation of the rotor disc about its axis, means for rotating the disc about its axis, means for detecting the chemical reaction between the assay medium and the liquid reagent, and means for presenting the reaction data,

the lmprovement in the rotor disc which comprises

(i) a well in the rotor disc at a location between the disc axis and the mixing cuvette;

(ii) a solid microporous element contained within the well and having walls which define an internal cell structure with interconnecting cells, at least some of which open along exposed surfaces of the element;

(iii) a precise measured quantity of reagent contained within the cell structure of the microporous element, the reagent being in solid form yet capable of being solubilized or dispersed in an aqueous liquid to form a reagent-containing liquid;

(iv) a first delivery means for facilitating delivery of said reagent-containing liquid from the microporous element into the cuvette via propulsion under the influence of centrifugal force during rotation of the rotor disc in at least one direction about its axis; and

(v) a second delivery means, for delivering an aqueous liquid into the well for dissolving or dispersing reagent in the element to form said reagent-containing liquid, said second delivery means consisting of a chamber in the rotor disc communicating with the well and a standpipe protruding through a cover on the rotor disc and communicating with the chamber.

4,588,556

ARRANGEMENT FOR PLACING A SEPARATING GEL BETWEEN TWO PHASES LOCATED IN A SAMPLE TUBE

Walter Sarstedt, Nümbrecht-Rommelsdorf, Fed. Rep. of Germany, assignor to Walter Sarstedt Kunststoff-Spritzgusswerk, Rommelsdorf, Fed. Rep. of Germany

Filed Nov. 29, 1984, Ser. No. 676,329

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1983, 3343887

Int. Cl.[4] B01L *11/00*

U.S. Cl. 422—101 **20 Claims**

1. An apparatus for placing a separating gel (16) between two phases of different specific gravity which initially form a dispersion or a suspension in a sample tube (12), said sample tube having a closed bottom and an open or openable top, comprising:

a container (11) adapted to hold said separating gel, said container having a closed bottom and an open top and being shaped such that said container can be inserted into said sample tube up to the bottom of said sample tube; and

a lid (14) displaced within said container and slidable up and down inside said container, said lid having at least one opening (15, 15') which is small relative to the area of said lid, said lid having a specific gravity greater than the specific gravity of said separating gel.

4,588,557

OIL TUBE POSITIONER FOR RADIAL OIL CARBON BLACK REACTION

E. Webb Henderson, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesvillea, Okla.

Filed Jun. 25, 1984, Ser. No. 624,314

Int. Cl.[4] C09C *1/48;* **F23C** *5/06;* **F23N** *5/24*

U.S. Cl. 422—108 **11 Claims**

1. In a carbon black reactor apparatus for producing carbon black, said apparatus comprising a shell which defines a feed zone, a combustion zone, a mixing zone, and a quench zone; at least one make-hydrocarbon oil injection assembly extending through the shell of the carbon black reactor, each said at least one oil injection assembly comprising a tubular member having an oil receiving end and an oil discharging end and a spray nozzle on the oil discharging end of the tubular member; a source of oil; a conduit connecting the source of oil with the oil receiving end of the tubular member; the improvement comprising: a sensor means adjacent said oil injection assembly for detecting a value indicative of impedance of the oil flow through said assembly and generating a signal in relationship to said value; a controller means for processing the signal; a means for transmitting the signal from the sensor means to the controller means; and an adjustment means coupled to the controller means for moving said nozzle assembly inwardly or outwardly in relation to the position of the nozzle assembly with respect to said shell in response to said signal in order to prevent spray nozzle burnout.

4,588,558

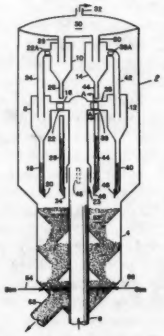
CLOSED FCC CYCLONE SYSTEM

Anthony Y. Kam; Frederick J. Krambeck, both of Cherry Hill, and Klaus W. Schatz, Skillman, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 6, 1983, Ser. No. 529,452

Int. Cl.[4] B01J *8/18;* **B01D** *45/12;* **B04C** *5/20*

U.S. Cl. 422—113 **37 Claims**



1. An apparatus for the fluid catalytic cracking of a hydro-

carbon feed in a closed cyclone system, said apparatus comprising:

a reaction vessel;

a riser conversion zone defined by a vertically disposed elongated tubular conduit means having an upstream end and a downstream end, said downstream end terminating within said reaction vessel;

said riser conversion zone having a suspension of hydrocarbon feed and catalyst introduced into the upstream end thereof and a mixture of the catalyst and cracked hydrocarbon feed exiting from the downstream end thereof;

a primary cyclone connected to said downstream end by a first enclosed conduit;

a first surge capacity means located on said first enclosed conduit, for accommodating a sudden increased rate of flow of said mixture within said first enclosed conduit, said first surge capacity means being substantially closed during a normal rate of flow of said mixture within said first enclosed conduit, wherein said first surge capacity means comprises first means for preventing catalyst flow therethrough when said first surge means is substantially closed and first means for allowing stripping gas flow therethrough when said first surge means is substantially closed;

a secondary cyclone connected to said primary cyclone by a second enclosed conduit, said first and said second conduits completely separating the material conducted therein from the atmosphere of said reactor vessel;

means defining a catalyst stripping zone; and

means for passing at least a portion of stripping gas from said catalyst stripping zone to said riser conversion zone.

10. An apparatus for the fluid catalytic cracking of a hydrocarbon feed in a closed cyclone system, said apparatus comprising:

a reaction vessel;

a riser conversion zone defined by a vertically disposed elongated tubular conduit means having an upstream end and a downstream end, said downstream end terminating within said reaction vessel;

said riser conversion zone having a suspension of hydrocarbon feed and catalyst introduced into the upstream end thereof and a mixture of the catalyst and cracked hydrocarbon feed exciting from the downstream end thereof;

wherein said riser conversion zone comprises two serially overlapped vertically extending sections, wherein an annular port is defined between said two sections and wherein the top of the lower section of said riser conversion zone is of a relatively larger diameter than the bottom of the upper section of said riser conversion zone;

a primary cyclone connected to said downstream end by a first enclosed conduit;

a secondary cyclone connected to said primary cyclone by a second enclosed conduit, said first and said second conduits completely separating the material conducted therein from the atmosphere of said reactor vessel; and

means defining a catalyst stripping zone.

4,588,559

LIME SLAKING SYSTEM INCLUDING A CYCLONE AND CLASSIFIER FOR SEPARATING CALCIUM HYDROXIDE AND GRIT PARTICLES FROM A SLURRY THEREOF

Robert C. Emmett, Salt Lake City, Utah, assignor to Envirotech Corporation, Salt Lake City, Utah

Division of Ser. No. 456,923, Jan. 10, 1983, Pat. No. 4,482,528. This application Sep. 27, 1984, Ser. No. 655,390

Int. Cl.[4] C04B *2/04*

U.S. Cl. 422—162 **8 Claims**

1. A lime slaking system for hydration of lime and removal of unwanted grit particles comprising:

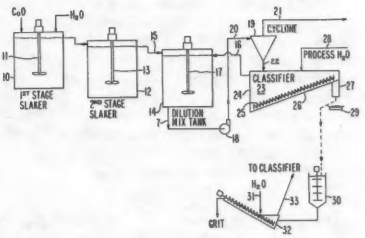
(a) vessel means for containing unhydrated lime particles, coarse grit particles and water;

(b) means in said vessel means for mixing unhydrated lime particles and water so as to react said lime particles to form calcium hydroxide;

(c) a dilution mix tank operably connected to an outlet of said vessel means;

(d) a cyclone operably connected to an output from said dilution mix tank;

(e) said cyclone having an overflow outlet for a light overflow fraction comprising useful slaked lime product and an underflow outlet for an underflow fraction comprising coarse grit particles;



(f) a classifier means operably connected in flow communication with said cyclone underflow outlet, including means for feeding cyclone underflow material to a pool in said classifier means;

(g) means for feeding dilution water into said classifier means; and

(h) means for transporting water overflow from said classifier means to said dilution mix tank.

4,588,560

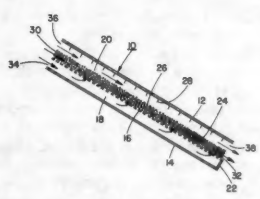
HYDROPROCESSING REACTOR FOR CATALYTICALLY DEWAXING LIQUID PETROLEUM FEEDSTOCKS

Thomas F. Degnan, Yardley, Pa., and Bruce P. Pelrine, Lawrenceville, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 29, 1984, Ser. No. 626,559

Int. Cl.[4] B01J *8/08*

U.S. Cl. 422—211 **11 Claims**



1. A fixed-bed hydroprocessing reactor for catalytically dewaxing liquid petroleum feedstocks, comprising:

(a) an upper and a lower imperforate plate arranged in parallel spaced relationship and being inclined relative to the horizontal axis, said plates defining a flowspace therebetween;

(b) an inclined perforate plate extending in parallel spaced relationship between said upper and said lower imperforate plates so as to form a first flowspace between said upper plate and said perforate plate, said first flowspace comprising a headspace above an inclined stationary catalyst bed being supported by said inclined perforate plate and extending into said first flowspace, and a second flowspace between said perforate plate and said lower plate; said second flow space having an open end and a closed end, said closed end being sealed by a closure

means which extends between said perforate plate and said lower plate;

(c) said catalyst bed being of a crystalline catalyst material said bed having an upper end and a lower end with respect to said incline;

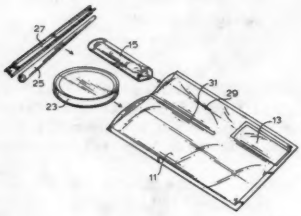
(d) means for introducing liquid petroleum feed-stock into said upper end of said inclined catalyst bed to cause said feedstock to trickle down towards the lower end thereof; means for injecting hydrogen into the second flowspace from the open end thereof at a pressure to cause said hydrogen to pass upwardly through said perforate plate and to percolate through said catalyst bed and to strip low-boiling volatile conversion products from said liquid petroleum feedstock, said hydrogen gas and entrained conversion products rising into said headspace above said catalyst bed in the first flowspace; means for introducing an inert carrier gas into said headspace from one end thereof for scavenging said hydrogen gas and entrained conversion products from said reaction to form a dewaxed product; and means allowing said dewaxed product formed in said reactor to exit from said reactor.

4,588,561

PACKAGE FOR REMOVING OXYGEN FROM A GASEOUS MIXTURE

James E. Aswell, New Freedom, Pa., and William E. Moritz, III, Reisterstown, Md., assignors to Becton, Dickinson and Company, Paramus, N.J.

Filed Jul. 6, 1984, Ser. No. 628,670
Int. Cl.[4] B01J *7/02*
U.S. Cl. 422—238 **13 Claims**



1. A package for removing oxygen from a gaseous mixture within a confined space comprising:

(1) a sealable envelope

(2) a gas permeable sachet located within said envelope containing (1) an oxygen reactive material selected from the group consisting of iron powder, copper powder and aluminum powder, (2) a carbon dioxide generating composition including a water soluble, solid acid and a water soluble carbonate, (3) a filler selected from the group consisting of diatomaceous earth, charcoal, cellulose fiber, silica gel and barium sulfate and (4) a water dispersive and wetting surfactant,

(3) a compartment within said envelope in fluid communication with said sachet location for receiving a predetermined level of water.

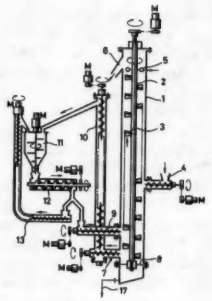
4,588,562

APPARATUS FOR PURIFYING CRYSTALS

Shigeru Saitoh, Nakano; Masaaki Shimada, and Takeshi Imura, both of Iwaki, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 16, 1984, Ser. No. 631,443
Claims priority, application Japan, Jul. 21, 1983, 58-133209
Int. Cl.[4] B01D *9/00*
U.S. Cl. 422—245 **4 Claims**

1. In a crystal purifying apparatus comprising a crystal purifying tower having a transverse cross-section, a rotational shaft disposed within the tower, blade members spirally attached to the exterior of the shaft to provide a stirrer, said purifying tower having a starting material feed means disposed about at the middle portion thereof, a heating means and means defining a a product take out port disposed at the upper portion thereof, a low purity crystal component take out means and a means for extracting a portion of the crystal component at low purity out of said tower disposed at the lower portion thereof, means for crystallizing the crystal component at low purity taken out by the low purity crystal component take out means, means for cooling the crystallized component, said crystallizing and cooling means disposed outside of said purifying tower, and



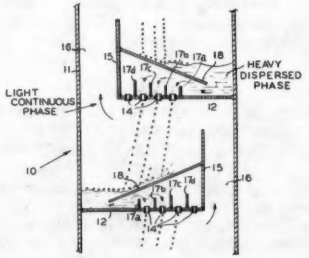
means for feeding the crystallized and resultant cooled crystals to said purifying tower, the improvement in said means for crystallizing and means for cooling comprising a crystal mixing tank having an exhaust tube part at the bottom of the tank for mixing the crystal component at low purity taken out from said purifying tower with pre-cooled crystals to cool and crystallize the same, a cooler for continuously cooling said cooled and crystallized crystals from the mixing tank to a desired temperature, and a feed means for feeding a portion of the crystals cooled in the cooler back into said crystal mixing tank, and additional feed means for feeding the balance of said crystals cooled in the cooler to said purifying tower.

4,588,563

CASCADE SIEVE TRAY FOR EXTRACTION AND DEASPHALTING

Robert J. Fiocco, Summit, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Jan. 13, 1984, Ser. No. 570,668
Int. Cl.[4] B01D *11/04*; C01C *3/08*
U.S. Cl. 422—256 **5 Claims**



1. In a vertical walled liquid-liquid contacting apparatus of the type having two ends opposite each other, first inlet means for the introduction of a first fluid located at one end of said apparatus for continuous flow of said first fluid through said apparatus, first outlet means located at the opposite end of said

apparatus for removal of said first fluid, second inlet means for introduction of a second fluid for dispersed flow through said apparatus wherein said second inlet means is located at said opposite end of said apparatus, second outlet means for removal of said second fluid located at said one end of said apparatus at least two vertically spaced horizontal oriented sieve tray assemblies within said apparatus and including means for supporting said sieve tray assemblies in said apparatus, each sieve tray assembly includes a substantially horizontal sieve tray having a generally non-perforated first area and a second area with a plurality of perforations therein for allowing a flow of said second fluid therethrough whereby said second fluid is dispersed into droplets, and conduit means through each sieve tray assembly for flow therethrough of said first fluid, said sieve tray assemblies being positionioned in said apparatus such that said second areas of said sieve trays are substantially one above the other, the improvement comprising:

a plurality of vertical weirs attached to said second area of each said sieve tray separating groups of perforations having predetermined hole areas; and

a collector-coalescer plate associated with each of said sieve trays, each said collector-coalescer plate having a first end and a second end and being disposed substantially transverse to the vertical axis of the apparatus and the axes of the perforations in said second area of its sieve tray associated therewith, each said collector-coalescer plate being rigidly supported therein by plate support means, each said collector-coalescer plate being sloped such that the first end thereof terminates in the region of, but spaced apart from said first area of its associated sieve tray, said first end of said collector-coalescer plate being closer to its associated sieve tray than said second end, each of said collector-coalescer plates being positioned so that under conditions of use said dispersed second fluid is collected and coalesced on each said collector-coalescer plate thereby forming a liquid stream which flows first towards said first area of its associated sieve tray, then between said sieve tray and said first end of said collector-coalescer plate, and ultimately toward said second area of said sieve tray for further dispersed flow therethrough.

4,588,564

PROCESS FOR RECOVERING ARSENIC TRIOXIDE FROM EXHAUST GAS OF SMELTING

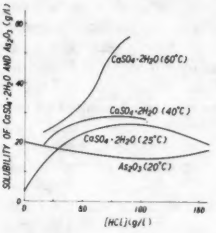
Hiroshi Kohno; Haruhiko Asao; Masao Kuwabara, and Takashi Shimizu, all of Fukushima, Japan, assignors to Onahama Smelting and Refining Company, Ltd., Tokyo, Japan

Filed Oct. 12, 1984, Ser. No. 660,110

Claims priority, application Japan, Mar. 16, 1984, 58-049291

Int. Cl.⁴ C01B *27/00*

U.S. Cl. 423—87 **6 Claims**



1. A process for recovering arsenic trioxide from exhaust gas of sulfide ore smelting, comprising subjecting the exhaust gas to dust collecting treatment at a temperature of not lower than 250° C., scrubbing the gas with water, whereby the amount of water is adjusted so that the arsenic concentration in the scrubbing solution is at least 80% of the saturation concentration at a temperature not lower than the dew point of water in the exhaust gas, thus separating out solid particles suspended in the solution, crystallizing arsenic trioxide from the solution by vacuum evaporation or cooling at a pH not higher than 2, treating the crystals separated from the mother liquid with a hydrochloric acid solution of a concentration of 50–150 g/l and of a temperature not higher than 30° C., and collecting the crystals that remain.

4,588,565

SEPARATION OF LITHIUM CHLORIDE FROM IMPURITIES

Lawrence E. Schultze, Sparks; Donald J. Bauer, and Ronald M. Arington, both of Reno, all of Nev., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Aug. 1, 1984, Ser. No. 636,765

Int. Cl.⁴ C01D *15/04*

U.S. Cl. 423—179.5 **6 Claims**

1. A method for the separation of lithium chloride from calcium chloride comprising:

(a) preferentially dissolving lithium chloride from a lithium chloride-calcium chloride mixture in tetrahydrofuran, thereby forming a tetrahydrofuran solution, so that insoluble calcium chloride is not dissolved;

(b) separating the tetrahydrofuran solution from the insoluble calcium chloride; and

(c) evaporating the tetrahydrofuran containing substantially pure lithium chloride.

4,588,566

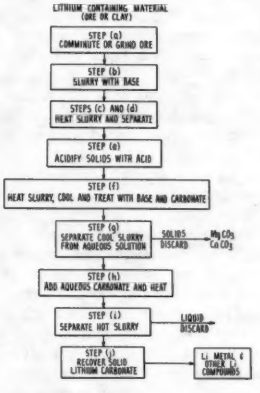
EXTRACTION OF LITHIUM FROM LITHIUM-CONTAINING MATERIALS

Harris E. Kluksdahl, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jul. 23, 1985, Ser. No. 757,875

Int. Cl.⁴ C01D *15/02*

U.S. Cl. 423—179.5 **19 Claims**


LITHIUM CONTAINING MATERIAL (ORE OR CLAY)
STEP (a) COMMINUTE OR GRIND ORE
STEP (b) SLURRY WITH BASE
STEPS (c) AND (d) HEAT SLURRY AND SEPARATE
STEP (e) ACIDIFY SOLIDS WITH ACID
STEP (f) HEAT SLURRY, COOL AND TREAT WITH BASE AND CARBONATE
STEP (g) SEPARATE COOL SLURRY FROM AQUEOUS SOLUTION
SOLIDS DISCARD
Mg CO3 Ca CO3
STEP (h) ADD AQUEOUS CARBONATE AND HEAT
STEP (i) SEPARATE HOT SLURRY
LIQUID DISCARD
STEP (j) RECOVER SOLID LITHIUM CARBONATE
Li METAL & OTHER Li COMPOUNDS

1. A method for recovering lithium from a material containing a low concentration of lithium, which method comprises:

(a) reducing the material to small particles having average diameter of about 500 microns or finer;

(b) slurrying the particles of step (a) with an aqueous solution of base wherein said base is selected from the group consisting of sodium carbonate, sodium hydroxide, potassium carbonate and potassium hydroxide;

(c) heating the slurry of step (b) at about 50° to 125° C. for about between about 0.1 to 6 hr;

(d) separating the solids and liquid of step (c);

(e) acidifying the solids of step (d) with aqueous sulfuric acid to pH of about 0 to 2;

(f) heating the slurry of step (e) at between about 50° to 125° C. for between about 0.5 to 10 hr followed by cooling and treating the slurry with sodium hydroxide, potassium hydroxide or calcium hydroxide to pH of about 7 and sodium carbonate or potassium carbonate to pH of about 12;

(g) filtering the cool slurry of step (f);

(h) reacting of the liquid phase of step (g) with a sufficient aqueous alkali carbonate to precipitate lithium carbonate and heating to between about 60° to 125° C. for between about 0.5 and 10 hr; and

(i) separating the hot slurry of step (h) to recover the lithium value as solid lithium carbonate.

4,588,567

RECOVERY OF CONCENTRATED H_2S FROM SO_2 CONTAINED IN FLUE GAS

Ralph Miller, 5 Laurel Hill Dr., Pleasantville, N.Y. 10570

Filed Jan. 28, 1985, Ser. No. 695,634

Int. Cl.[4] C01B *17/00, 31/20, 17/60*

U.S. Cl. 423—242 **10 Claims**

1. A regenerable process for the removal of sulfur dioxide from a gas in which it is contained and its subsequent recovery as hydrogen sulfide as a concentrated gas, said process comprising the steps of:

(a) contacting said gas with a recycled, aqueous, alkaline reaction medium containing a high concentration of dissolved sodium sulfite to react the bulk of the sulfur dioxide with sodium sulfite to form a reaction medium containing dissolved sodium pyrosulfite and sodium sulfite, said recycled, alkaline reaction medium being supplied from the separated solution obtained in step (d);

(b) adding, in the substantial absence of air, sufficient sodium carbonate formed in step (g) to the reaction medium formed in step (a) to react with the dissolved sodium pyrosulfite to form a slurry of solid sodium sulfite suspended in the resulting aqueous, alkaline reaction medium and concentrated, gaseous carbon dioxide;

(c) separating the concentrated, gaseous carbon dioxide and recycling it to step (i);

(d) separating solid sodium sulfite from the aqueous, alkaline reaction medium and recycling said reaction medium to step (a);

(e) reducing the separated sodium sulfite to sodium sulfide;

(f) mixing the sodium sulfide formed in step (e) with water;

(g) reacting, in the substantial absence of air, the sodium sulfide contained in the mixture formed in step (f) with particles of solid sodium bicarbonate from step (j) at a temperature sufficiently high to form a slurry of solid sodium carbonate suspended in a saturated sodium carbonate solution and a gas mixture consisting primarily of water vapor and hydrogen sulfide and recovering the hydrogen sulfide;

(h) recycling part of the solid sodium carbonate formed in step (g) to step (b);

(i) adding the remainder of the sodium carbonate formed in step (g) to a saturated sodium bicarbonate solution and carbonating the resulting mixture with carbon dioxide formed in step (b) to form a slurry of solid particles of sodium bicarbonate dispersed in said solution; and

(j) separating particles of sodium bicarbonate from the slurry formed in step (i) and recycling said separated particles to step (g).

4,588,568

METHOD OF BINDING SULFUR COMPOUNDS, WHICH RESULT AS REACTION PRODUCTS DURING THE COMBUSTION OF SULFUR-CONTAINING FUELS, BY ADDITION OF ADDITIVES

Siegfried Pollmann, and Gabriele Raupach, both of Gummersbach, Fed. Rep. of Germany, assignors to L. & C. Steinmüller GmbH, Gummersbach, Fed. Rep. of Germany

Filed Feb. 23, 1984, Ser. No. 582,928

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1983, 3306795

Int. Cl.[4] C01B *17/00;* **B01J** *8/00*

U.S. Cl. 423—244 **8 Claims**

1. A method of binding sulfur compounds consisting essentially of sulfur dioxide and traces of sulfur trioxide which result as reaction products during the combustion of sulfur-containing fuels in firing equipment; said method comprising the step of adding an additive in the form of a mixture consisting of sodium carbonate and an magnesium oxide in predetermined proportion by weight relative to each other including a lesser amount of sodium carbonate part by weight than that of magnesium oxide having effectiveness thereof evolve collectively in a relatively high temperature region with which there is avoided any danger that sulfur compounds already bound will again be released; said additive mixture including approximately one part by weight sodium carbonate, and approximately two parts by weight magnesium oxide; and for a burner firing, includes the step of adding said additive mixture into the periphery of the respective flames.

4,588,569

DRY INJECTION FLUE GAS DESULFURIZATION PROCESS USING ABSORPTIVE SODA ASH SORBENT

Michael J. Cyran, Gastonia, N.C., and William C. Copenhafer, Yardley, Pa., assignors to Intermountain Research & Development Corporation, Green River, Wyo.

Filed Feb. 21, 1985, Ser. No. 704,105

Int. Cl.[4] C01B *17/00;* **B01J** *8/00*

U.S. Cl. 423—244 **25 Claims**

1. A dry injection flue gas desulfurization process which comprises

injecting a dry soda ash sorbent, which is a particulate solid derived from calcination under non-sintering conditions of a $NaHCO_3$-containing compound, into a SO_2-contaminated flue gas stream that contains moisture in an amount of 0.5–10 wt % H_2O and is at a temperature of 100°–175° C.;

providing an amount of injected sorbent and sufficient gas-sorbent contact time such that a substantial portion, at least 40%, of the sorbent sodium content is utilized at a NSR = 1, in reducing the concentration of SO_2 in the gas stream,

collecting the sorbent in a solids-collection device which is a fabric filter baghouse or an electrostatic precipitator;

discharging collected sorbent from the solids-collection device;

the dry soda ash sorbent being a porous calcine obtained from calcination of sodium sesquicarbonate, sodium bicarbonate, Wegscheider's salt or mixtures of these, and further characterized by having a minimum surface area of at least 2 m^2/g and a residual bicarbonate content of less than 10 wt % $NaHCO_3$.

4,588,570

METHOD FOR THE PREPARATION OF PHOSPHORIC ACID AND CALCIUM SULPHATE

Armand L. Davister, Liège; Andre R. Dubreuco, Saint-Georges, and Francis A. Thirion, Liège, all of Belgium, assignors to Prayon Development, Engis, Belgium

PCT No. PCT/BE84/00008, § 371 Date Nov. 20, 1984, § 102(e) Date Nov. 20, 1984, PCT Pub. No. WO84/03690, PCT Pub. Date Sep. 27, 1984

PCT Filed Mar. 13, 1984, Ser. No. 673,436

Claims priority, application Luxembourg, Mar. 25, 1983, 84.713

Int. Cl.[4] C01B *25/16*

U.S. Cl. 423—320 33 Claims

1. A continuous method for preparing phosphoric acid and calcium sulfate, by reacting calcium phosphate with a mixture of sulfuric and phosphoric acids, said method comprising at least three succeeding crystallizing steps, (a) a first step of reacting the phosphate with said mixture of sulfuric and phosphoric acids at a temperature of from 70° to 100° C., with a P_2O_5 concentration comprised between 38 and 50%, in the presence of sulfuric acid with a concentration of between 0.25 and 2.5%, to provide a solid content in the mixture of between 20 and 38%, and with a reaction time of between 2 and 4 hours, to produce α-hemihydrate calcium sulfate and separating the produced phosphoric acid therefrom; (b) a second step of reacting the hemihydrate at a temperature of from 40° to 80° C., changing the concentration in the liquid phase of P_2O_5 to between 15 and 35%, and of the sulfuric acid between 0.5 and 17.5%, with a solid content of between 22 and 62%, and a reaction time of between 4 and 16 hours, to obtain a dihydrated calcium sulfate; and (c) a third step of reacting the dihydrate at a temperature of from 60° to 100° C., retaining in the liquid phase a P_2O_5 content of from 15 to 34% and a sulfuric acid concentration of from 7 to 25%, and a solid content of between 20 and 34%, a reaction time from 0.5 to 3 hours to transform the dihydrate into a form selected from the group consisting of α-hemihydrate, II-anhydrite, and mixtures thereof.

4,588,571

PROCESS FOR THE PURIFICATION OF SILICON BY THE ACTION OF AN ACID

Erich Bildl, Post Franking, Austria; Josef Dietl, Neuötting, Fed. Rep. of Germany; Rolf Baueregger, Burgkirchen, Fed. Rep. of Germany, and Dieter Seifert, Neuötting, Fed. Rep. of Germany, assignors to Heliotronic Forschungs-und Entwicklungsgesellschaft fur Solarzellen-Grundstoffe mbH, Burghausen, Fed. Rep. of Germany

Filed Apr. 19, 1984, Ser. No. 601,804

Claims priority, application Fed. Rep. of Germany, May 11, 1983, 3317286

Int. Cl.[4] C01B *33/02*

U.S. Cl. 423—348 17 Claims

1. In a process for the production of solar grade silicon by purification of silicon of the type including the step of purifying silicon by the action of an acid, the improvement comprising the steps of:

(a) establishing the silicon to be purified as a stationary phase; and

(b) establishing at least one acid as a mobile phase and passing said mobile phase under pressure through said stationary phase so that said acid absorbs impurities from the silicon during its passage, leaving behind the silicon in a purer state.

4,588,572

PROCESS FOR PREPARING AQUEOUS COBALT (II) CARBONATE SLURRIES, AND SLURRIES SO PRODUCED

Michael P. Vincler, Seneca, Pa., and Thomas E. Meigs, Parma, Ohio, assignors to Mooney Chemicals, Inc., Cleveland, Ohio

Filed Oct. 12, 1984, Ser. No. 660,022

Int. Cl.[4] C01B *31/24*

U.S. Cl. 423—419 R 14 Claims

1. A process for preparing an aqueous cobalt (II) carbonate slurry which comprises the steps of:

(a) reacting a water-soluble cobalt (II) salt with a water-soluble carbonate in water and in an inert atmosphere at a temperature of up to about 130° F., the equivalent ratio of said water-soluble carbonate to said cobalt (II) salt being at least about 1:1,

(b) completing the reaction by raising the reaction temperature to a temperature between about 140° and about 212° F. whereby a mixture of cobalt carbonate and a water-soluble by-product salt in water is obtained,

(c) filtering the mixture and recovering a wet filter cake,

(d) washing the wet filter cake with water, and

(e) preparing an aqueous slurry of cobalt carbonate from the wet filter cake.

4,588,573

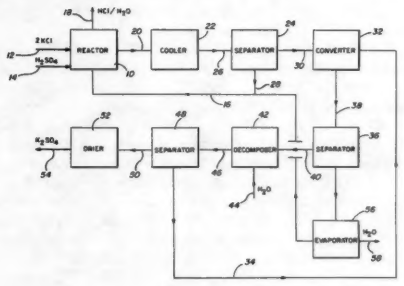
METHOD FOR THE PRODUCTION OF POTASSIUM SULFATE USING SULFURIC ACID AND POTASSIUM CHLORIDE

Ralph E. Worthington, Winter Haven; Alex Magdics, and Donald B. Stain, both of Lakeland, all of Fla., assignors to Prodeco, Inc., Mulberry, Fla.

Continuation-in-part of Ser. No. 536,378, Sep. 27, 1983, Pat. No. 4,554,151. This application Apr. 19, 1984, Ser. No. 602,036

Int. Cl.[4] C01D *15/06;* C01B *7/01*

U.S. Cl. 423—552 10 Claims



1. A process for the preparation of potassium sulfate, comprising:

(1) feeding potassium chloride and sulfuric acid in substantially the stoichiometric ratio to produce potassium sulfate into a recycled aqueous solution containing K^+, H^+ and sulfate and bisulfate ions;

(2) evaporating substantially all of the hydrogen chloride produced in step (1) along with water and condensing the hydrogen chloride and water mixture to form a solution having a concentration greater than about 30% HCl w/w;

(3) cooling the solution resulting from step (2) to crystallize $KHSO_4$ or a double salt of potassium sulfate and sulfuric acid;

(4) separating said $KHSO_4$ or double salt to form a first mother liquor and recycling said first mother liquor to step (1);

(5) dissolving said $KHSO_4$ or double salt in water or an aqueous solution containing K^+, H^+ and sulfate and bisulfate ions and sequentially decomposing said $KHSO_4$

or double salt to form potassium sulfate and a second mother liquor rich in sulfuric acid and separating said potassium sulfate from said second mother liquor;

(6) evaporating said second mother liquor to remove at least a portion of said water; and

(7) recycling said concentrated second mother liquor to step (1).

4,588,574

PROCESS FOR THE PREPARATION OF BARIUM SULFATE OF INCREASED FLOWABILITY AND DENSITY, SUITABLE AS A RADIO-OPAQUE COMPONENT IN RADIOGRAPHIC CONTRAST AGENTS, PRODUCT OBTAINED ACCORDING TO THIS PROCESS AND THE RADIOGRAPHIC CONTRAST AGENT PRODUCED THEREFROM

Ernst Felder, Vitale, Switzerland, and Maria Zingales, deceased, late of Milan, Italy (by Martinis Marchi Jellicich Maria Sonia, administrator), assignors to Bracco Industria Chimica S.p.A., Italy

Filed Jul. 31, 1984, Ser. No. 636,399

Claims priority, application Italy, Aug. 4, 1983, 22425 A/83

Int. Cl.[4] C01F *11/46*

U.S. Cl. 423—554 **14 Claims**

13. In a radiographic contrast agent composition composed of a radio-opaque effective amount of barium sulfate and conventional additives, the improvement which comprises said barium sulfate having a bulk density of at least 2.5 g/ml and whose suspension in pure water has a viscosity not greater than 1,000 mPas at a concentration of 200 g per 100 ml.

4,588,575

PRODUCTION OF MICROCRYSTALLINE METAL OXIDES

Lawrence D. David, Wappingers Falls, N.Y., assignor to Celanese Corporation, New York, N.Y.

Filed Nov. 1, 1984, Ser. No. 667,303

The portion of the term of this patent subsequent to Dec. 4, 2001, has been disclaimed.

Int. Cl.[4] B22F *9/24;* C01F *5/02;* C01G *1/02;* C04B *35/26*

U.S. Cl. 423—594 **30 Claims**

1. A process for the production of a microcrystalline metal oxide powder which comprises (1) forming a homogeneous solvent solution containing a solute of one or more metalorganic compounds; (2) subjecting the solution to ultrasonic wave energy, while treating the said solution to cause formation of a gelled solution; (3) removing solvent medium from the gelled solution to provide a residual mass of precursor solids; and (4) pyrolyzing the precursor solids in the presence of molecular oxygen to form a metal oxide composition having an average particle size less than about 1000 angstroms.

4,588,576

PRODUCTION OF MICROCRYSTALLINE ZIRCONIA

Lawrence D. David, Wappingers Falls, N.Y., assignor to Celanese Corporation, New York, N.Y.

Division of Ser. No. 667,303, Nov. 1, 1984. This application Aug. 15, 1985, Ser. No. 765,691

The portion of the term of this patent subsequent to May 28, 2002, has been disclaimed.

Int. Cl.[4] B22F *9/24;* C01G *1/02, 25/02;* C04B *35/26*

U.S. Cl. 423—608 **8 Claims**

1. A process for the production of a microcrystalline metal oxide powder which comprises (1) forming a homogeneous solvent solution containing a solute of zirconium metalorganic compound; (2) subjecting the solution to ultrasonic wave energy, while treating the said solution to cause formation of a gelled solution; (3) removing solvent medium from the gelled solution to provide a residual mass of precursor solids; and (4) pyrolyzing the precursor solids in the presence of molecular oxygen to form a metastable tetragonal zirconia powder having an average particle size less than about 1000 angstroms.

4,588,577

METHOD FOR GENERATING HYDROGEN

Earl V. Cardinal, 11105 Oak View Dr., Austin, Tex. 78759

Continuation-in-part of Ser. No. 591,600, Mar. 20, 1984, abandoned. This application Mar. 8, 1985, Ser. No. 709,527

Int. Cl.[4] C01B *13/00*

U.S. Cl. 423—657 **13 Claims**

1. A thermally activated method of generating hydrogen gas consisting of contacting a finely divided metallic catalyst selected from the group consisting of nickel, cobalt, iron, palladium, platinum, copper, magnesium, manganese, alloys of said metals and mixtures thereof with water which is maintained at a temperature from 60° C. to 150° C. and which contains a chelating agent.

4,588,578

LIPID VESICLES PREPARED IN A MONOPHASE

Michael W. Fountain, Plainsboro; Steven J. Weiss, Heightstown, and Mircea C. Popescu, Plainsboro, all of N.J., assignors to The Liposome Company, Inc., Princeton, N.J.

Filed Aug. 8, 1983, Ser. No. 521,176

Int. Cl.[4] A61K *43/00, 49/00*

U.S. Cl. 424—1.1 **83 Claims**

1. A method for preparing lipid vesicles comprising:

(a) forming a solution of an amphipathic lipid in at least one organic solvent plus a first aqueous component in amounts sufficient to form a monophase;

(b) evaporating the organic solvent or solvents of the monophase at a temperature and pressure which maintains the monophase and facilitates evaporation until a film forms; and

(c) adding a second aqueous component to the film and agitating the second aqueous component with the film in order to resuspend the film and to form lipid vesicles.

4,588,579

PROCESS FOR THE PRODUCTION OF THIN SECTIONS OF BIOLOGICAL TISSUE

Karlheinz Bachhuber, Ulm, and Dieter Frösch, Blaustein, both of Fed. Rep. of Germany, assignors to Rolf Bachhuber, Blaubeuren, Fed. Rep. of Germany

Filed Oct. 14, 1983, Ser. No. 541,966

Claims priority, application Fed. Rep. of Germany, Oct. 19, 1982, 3238639

Int. Cl.[4] G01N *1/06;* A01N *1/00, 1/02, 3/00*

U.S. Cl. 424—3 **10 Claims**

1. In a process for the production of thin sections of biological tissue which includes dehydrating a fixed tissue sample to be investigated by infiltration of said fixed tissue sample with a hardenable medium miscible with water, subsequently embedding the dehydrated and infiltrated sample in a casting resin, and thereafter cutting thin sections from the cast body resulting from hardening of said casting resin, the improvement which comprises carrying out said infiltration by warming said fixed tissue sample in a mixture of formaldehyde, melamine and water, and during said warming said mixture forms water soluble monomeric methylolmelamines which infiltrate said tissue sample and undergo polycondensation to form water-insoluble polymeric methylolmelamine condensates in said tissue.

4,588,580

TRANSDERMAL ADMINISTRATION OF FENTANYL AND DEVICE THEREFOR

Robert M. Gale, Los Altos; Victor Goetz, Palo Alto; Eun S. Lee, Redwood City; Lina T. Taskovich, Palo Alto, and Su I. Yum, Los Altos, all of Calif., assignors to Alza Corporation, Palo Alto, Calif.

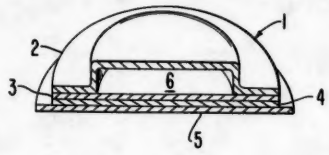
Filed Jul. 23, 1984, Ser. No. 633,762

Int. Cl.[4] A01N *25/24;* A61K *9/70*

U.S. Cl. 424—21 **58 Claims**

1. A process for inducing and maintaining analgesia which

comprises administering through an area of intact skin, a skin permeable form of a material selected from the group consisting of fentanyl and its analgetically effective derivatives at an



analgetically effective rate and continuing the administration of said material at said rate for an extended period of time at least sufficient to induce analgesia.

4,588,581

METHODS AND COMPOSITIONS FOR INTRAVAGINAL CONTRACEPTION

Irving R. Schmolka, Grosse Ile, Mich., assignor to BASF Corporation, Wyandotte, Mich.

Filed Nov. 16, 1984, Ser. No. 672,077

The portion of the term of this patent subsequent to Jan. 22, 2002, has been disclaimed.

Int. Cl.[4] A61K *31/74*

U.S. Cl. 424—45 **11 Claims**

1. A pressurized composition in an aerosol container capable of forming a spray upon release of pressure therefrom which composition is a liquid inside the container and forms a gel on contact with living tissue and which comprises by weight about 20 to 60 percent water, about 20 to 70 percent propellant, 0 to about 40 percent of a non-propellant volatile solvent, about 0.02 to 1.5 percent of a sperm function inhibitor, and about 7.5 to 30 percent polyoxyethylene-polyoxybutylene copolymer of the formula:

$$Y[(C_4H_8O)_n(C_2H_4O)_mH]x$$

wherein Y is the residue of a water-soluble organic compound containing therein x active hydrogen atoms; n is an integer; x is an integer greater than 1; the value of n and x are such that the molecular weight of the oxybutylene groups is from about 1500 to 6000 and the value of m is such that the oxyethylene groups constitute about 50 to 90 percent of the total weight of the compound.

4,588,582

TOOTHPASTE WITH ENTRAINED GAS

Minoo Motarjemi, Wirral, England, assignor to Lever Brothers Company, New York, N.Y.

Filed Sep. 27, 1984, Ser. No. 654,920

Claims priority, application United Kingdom, Sep. 28, 1983, 8325954

Int. Cl.[4] A61K *9/16*

U.S. Cl. 424—49 **3 Claims**

1. A transparent or opaque toothpaste whose appearance is stabilized against impaired uniform appearance due to larger bubble disproportionation during storage containing between 10% and 20% entrained air or other gas, the gas being incorporated as discrete bubbles having a diameter within the range 10 to 30 micron and giving the transparent toothpaste a pearlescent or metallized appearance which remains after three months storage of the toothpaste, while giving an opaque toothpaste increased viscosity and a richer, more creamy appearance than a non-aerated toothpaste.

4,588,583

SURGICAL MATERIAL

Hanns Pietsch, Hamburg; Volker Hohmann, Norderstedt, and Detlef Kluck, Buxtehude, all of Fed. Rep. of Germany, assignors to Beiersdorf Aktiengesellschaft, Hamburg, Fed. Rep. of Germany

Filed Oct. 25, 1983, Ser. No. 545,035

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1982, 3245956

Int. Cl.[4] A61K *6/08, 31/78;* **C08K** *5/10;* **C08F** *265/06*

U.S. Cl. 424—81 **15 Claims**

1. A bone cement based on liquid monomeric and pulverulent polymeric acrylates and/or methacrylates, catalysts and accelerators which bone cement passes via a plastic state into a solid state by mixing of the liquid and pulverulent components, which bone cement contains a liquid component consisting essentially of 1–15% by weight, based on the total weight of the bone cement, of a further liquid substance consisting essentially of one or more non-toxic, aliphatic esters selected from the group consisting of

glycol mono-formate, -acetate, -propionate, -glycolate and -lactate;
glycol di-formate, -acetate, -propionate, -glycolate and -lactate;
glycerol mono-formate, -acetate, -propionate, -glycolate and -lactate;
glycerol di-formate, -propionate, -glycolate and -lactate;
glycerol tri-formate, -priopionate, -glycolate and -lactate;
methyl-, ethyl-, propyl- and butyl-glycolate;
methyl-, ethyl-, propyl- and butyl-lactate;
monomethyl- and dimethyl-malate;
monoethyl- and diethyl-malate;
monopropyl- and dipropyl-malate;
monobutyl- and dibutyl-malate;
monomethyl- and dimethyl-tartrate;
monoethyl- and diethyl-tartrate;
monopropyl- and dipropyl-tartrate;
monobutyl-tartrate;
mono-, di- and trimethyl-citrate;
mono-, di- and triethyl-citrate;
mono-, di- and tripropyl-citrate;
mono-, di- and tributyl-citrate;

these liquid esters having a boiling point above 100° C.

12. A bone cement as claimed in claim **1**, wherein the methacrylate is methyl methacrylate which is stabilized with 50–100 ppm of hydroquinone or hydroquinone monomethyl ester.

4,588,584

MEDIUM FOR THE ISOLATION OF *PSEUDOMONAS CEPACIA* BIOTYPE FROM SOIL AND THE ISOLATED BIOTYPE

Robert D. Lumsden, Bowie, Md., and Myron Sasser, Newark, Del., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jun. 1, 1983, Ser. No. 500,043

Int. Cl.[4] A01C *1/06;* **A01N** *63/00;* **C12N** *1/20, 1/28*

U.S. Cl. 424—93 **3 Claims**

1. A biologically pure culture of the bacterium *Pseudomonas cepacia* designated as NRRL B-14149.

2. A biocontrol agent for controlling Pythium diseases of peas and cucumbers caused by *Pythium ultimum* and *Pythium aphanidermatum,* respectively, consisting essentially of a biologically pure culture of *Pseudomonas cepacia* NRRL B-14149 and an aqueous solution of gum arabic.

4,588,585

HUMAN RECOMBINANT CYSTEINE DEPLETED INTERFERON-β MUTEINS

David F. Mark, Danville; Leo S. Lin, Fremont, and Shi-Da Yu Lu, Oakland, all of Calif., assignors to Cetus Corporation, Emeryville, Calif.

Division of Ser. No. 564,224, Dec. 20, 1983, Pat. No. 4,518,584, which is a continuation-in-part of Ser. No. 486,162, Apr. 15, 1983, abandoned, which is a continuation-in-part of Ser. No. 435,154, Oct. 19, 1982, abandoned. This application Sep. 28, 1984, Ser. No. 655,897

Int. Cl.[4] A61K *45/02;* C07K *13/00, 15/26;* C12P *21/00*

U.S. Cl. 424—85 10 Claims

1. Recombinant, synthetic human interferon-β mutein, wherein the cysteine at position 17, numbered in accordance with native interferon-β, is deleted or replaced by a neutral amino acid, and wherein said mutein exhibits biological activity of native, human interferon-β.

4,588,586

METHOD FOR DISINFECTING A CONTACT LENS

Jack H. Kessler, 202 W. Newell Ave., Rutherford, N.J. 07070, and Robert S. Rosenbaum, 109 Anawan Ave., West Roxbury, Mass. 02109

Continuation-in-part of Ser. No. 455,420, Jan. 3, 1983, Pat. No. 4,473,550, which is a division of Ser. No. 225,762, Jan. 16, 1981, abandoned. This application Jun. 18, 1984, Ser. No. 621,792

The portion of the term of this patent subsequent to Sep. 25, 2001, has been disclaimed.

Int. Cl.[4] A61K *37/48, 33/40;* C12P *19/56;* D06M *16/00*

U.S. Cl. 424—94 11 Claims

1. A method for disinfecting a contact lens comprising forming a bactericide having a limited period of bacteriological activity, said bactericide comprising a source of peroxide, a peroxidase within the classification E.C. 1.11.1–7 and a source of predetermined donor molecules adapted to act as a substrate for said peroxidase, storing said three components in a non-reacting state such that said bactericide is inactive; admixing the three components in a liquid carrier to cause a catalyzed reaction by said peroxidase for generating free radicals from said source of donor molecules; selecting the concentration level of said three components such that a substantial percentage of said peroxide is consumed during said catalyzed reaction; and immersing the contact lens into said solution substantially simultaneous with the admixture of all three components whereby bacteria present on said contact lens will be killed during said limited period of bacteriological activity.

4,588,587

METHOD OF TREATMENT TO INHIBIT METASTASIS

Gabriel J. Gasic, Gulph Mills, Pa., assignor to Pennsylvania Hospital, Philadelphia, Pa.

Filed Mar. 1, 1983, Ser. No. 471,197

Int. Cl.[4] A61K *35/62*

U.S. Cl. 424—95 11 Claims

1. Method for treating an animal to inhibit metastasis of malignant cells, said method comprising administering to said animal a therapeutically effective amount of a composition comprising leech salivary gland extract derived by homogenization and solubilization, in aqueous solution, of leech salivary gland tissue and thereby isolating a product having antimetastatic properties.

4,588,588

ANTIBIOTIC EM5487

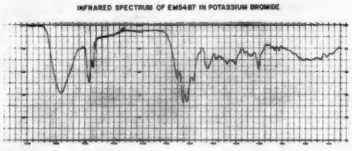
Edward Meyers, East Brunswick, and Raymond Cooper, Old Bridge, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Dec. 5, 1983, Ser. No. 557,803

Int. Cl.[4] A61K *35/00;* C12P *1/04*

U.S. Cl. 424—122 3 Claims

1. EM5487, having the approximate elemental analysis C, 64.98; H, 7.46; N, 5.86; having the infrared spectrum in potassium bromide shown in FIG. 1; having the 100 MHz ^{13}C NMR spectrum in deuterated methanol shown in FIG. 2; having the 400 MHz ^{1}H NMR spectrum is deuterated methanol shown in FIG. 3; and having the ultraviolet spectrum in methanol shown in FIG. 4.



2. A process for preparing EM5487 which comprises cultivating *Lysobacter gummosus* A.T.C.C. No. 39472 in an aqueous nutrient medium containing an assimilable carbohydrate and nitrogen source under submerged aerobic conditions until substantial EM5487 antibiotic activity is impaired to the medium and isolating the EM5487 antibiotic.

4,588,589

ANTIDIARRHEAL COMPOSITIONS AND USE THEREOF

Bhogilal B. Sheth, Norwalk; Sheri A. Gilbert, Stratford, and Jane F. Kinsel, Derby, all of Conn., assignors to Richardson-Vicks Inc., Wilton, Conn.

Filed Oct. 13, 1983, Ser. No. 541,551

Int. Cl.[4] A61K *35/78, 31/715, 31/60*

U.S. Cl. 424—195.1 20 Claims

1. An antidiarrheal composition comprising between about 100 to 3000 mg of bismuth subsalicylate and between about 50 to 9000 mg of a polymeric hydroabsorptive agent selected from the group consisting of psyllium and glucomannan wherein the weight ratio of bismuth subsalicylate to said psyllium is from about 1:0.5 to about 1:2.9 and the weight ratio of bismuth subsalicylate to said glucomannan is about 1:1.

4,588,590

METHOD OF TREATING KERATOSIS AND COMPOSITIONS USEFUL THEREFOR

Joel E. Bernstein, Deerfield, Ill., assignor to Jaye-Boern Laboratories, Inc., Northbrook, Ill.

Continuation-in-part of Ser. No. 332,676, Dec. 21, 1981, abandoned. This application Jan. 23, 1984, Ser. No. 572,899

Int. Cl.[4] A61K *35/78, 7/04, 31/60, 31/19*

U.S. Cl. 424—195.1 11 Claims

1. A method of treating warts, corns, and calluses comprising periodically applying to the affected area a nail polish composition containing an effective amount of at least one non-toxic and pharmaceutically acceptable corrosive agent sufficient to cause peeling of the wart, corn, or callus for relieving said warts, corns, or calluses.

4,588,591

ANALGESIC 2-OXA-SPIROCYCLIC COMPOUNDS

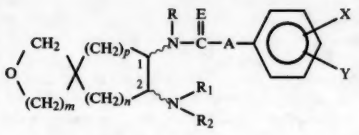
Lester J. Kaplan, Irvine, Calif., and Moses W. McMillan, Portage, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed May 25, 1984, Ser. No. 614,408

Int. Cl.[4] A61K *31/34, 31/35;* C07D *307/94, 311/96*

U.S. Cl. 514—409 10 Claims

1. A compound of the formula



(I)

wherein the stereochemistry at the spiro carbon atom is either of the two possible orientations;

the wavy line bonds between the cycloalkyl ring carbon atoms and the two nitrogen atoms indicate a cis or trans relationship of the two nitrogen-containing groups at positions 1 and 2 of the cycloalkyl ring;

wherein p is a whole number integer 0, 1, 2, 3 or 4 and n is a whole number integer 0, 1, 2, 3, or 4 so that the resulting cycloaliphatic ring containing them has 5, 6 or 7 carbon atoms;

m is 2 or 3;

A is a single chemical bond (—), $—(CH_2)_q$ where q is a whole number integer 1 to 4 or $—CH(CH_3)—$;

X and Y are independently selected from the group consisting of hydrogen, a halogen having an atomic number of from 9 to 35, trifluoromethyl, nitro, methoxy, hydroxy, azido, C_1 to C_3-alkyl, phenyl, methanesulfonyl, cyano, amino, C_1 to C_3-alkoxycarbonyl, C_1 to C_3-alkanoyloxy, C_1 to C_3-carboxacylamino ($—NHC(=O)R_4$ wherein R_4 is hydrogen or C_1 to C_2-alkyl);

R is hydrogen or C_1 to C_3-alkyl;

R_1 and R_2, taken separately, are each hydrogen, C_1 to C_3-alkyl or 2-propen-1-yl; or

R_1 and R_2, taken together with the nitrogen to which they are bonded complete a ring selected from the group consisting of azetidinyl, pyrrolidinyl and piperidinyl;

E is oxygen or sulfur; or a pharmacologically acceptable salt thereof.

4,588,592

CHEWING GUM PRODUCT AND COMPOSITION AND PROCESS FOR THE PREPARATION THEREOF

Ronald J. Elias, Mount Laurel, N.J., assignor to Fleer Corporation, Philadelphia, Pa.

Filed Jul. 18, 1984, Ser. No. 631,924
Int. Cl.[4] A23G *3/30*
U.S. Cl. 426—5 **37 Claims**

1. A chewing gum composition in the form of a flowable conglomerate consisting essentially of, by weight, from about 70 to about 95 percent of substantially dry granulated sugar, the predominant particle size of which is between about 210 and about 850 microns, intimately mixed with from about 5 to about 30 percent of substantially dry chewing gum base.

4,588,593

PROCESS FOR PREPARING CHEESE AND PRODUCT PRODUCED

Pierre Barthelemy, Barbery, and Michel Desmazeaud, Bures-sur-Yvette, both of France, assignors to Roussel Uclaf, Paris, France

Filed Apr. 28, 1983, Ser. No. 489,312
Claims priority, application France, Apr. 30, 1982, 82 07484
Int. Cl.[4] A23C *9/12*
U.S. Cl. 426—36 **9 Claims**

1. A process for the improving the cheese capacity of milk used in the preparation of uncooked or half-cooked pressed paste cheese comprising a dried crusted cheese having a dried extract weight of 50% to 55% of the finished cheese weight comprising adding to the milk before or during rennet treatment during the course of the preparation of said uncooked or half-cooked pressed paste cheese, 25 to 250 U/liter milk of an enzyme extracted from culture of *Micrococcus caseolyticus.*

4,588,594

PROCESS FOR PREPARING IMPROVED QUALITY CHEESES AND PRODUCT PRODUCED

Pierre Barthelemy, Barbery, and Jean Lablee, Mamirolle, both of France, assignors to Roussel Uclaf, Paris, France

Filed Apr. 28, 1983, Ser. No. 489,454
Claims priority, application France, Apr. 30, 1982, 82 07483
Int. Cl.[4] A23C *9/12*
U.S. Cl. 426—36 **9 Claims**

1. A process for improving the cheese capacity of milk used in the preparation of a soft paste cheese having a moldy crust and having a dried extract weight of 30% to 50% of the soft paste cheese weight intended to be ripened comprising adding to the milk before or during rennet treatment, during the course of the preparation of the said soft paste cheese, 50 to 190 U/liter of milk of an enzyme extracted from a culture of *Micrococcus caseolyticus.*

4,588,595

CULTURE CONTAINING A VIABLE CELL MASS OF BIFIDOBACTERIA AND LACTIC ACID BACTERIA

Shigeo Okonogi, Tokyo; Takuji Kawashima, Kawasaki; Tsutomu Kudo, Yokohama; Hiroya Yuguchi, Tokyo; Akinori Hiramatsu, Hachioji; Susumu Teraguchi, Tama, and Tomoko Yaeshima, Tokyo, all of Japan, assignors to Morinaga Milk Industry Co., Ltd., Tokyo, Japan

Filed Nov. 2, 1983, Ser. No. 547,827
Claims priority, application Japan, Nov. 9, 1982, 57-195376
Int. Cl.[4] A23C *9/127, 23/00;* C12N *1/20*
U.S. Cl. 426—43 **5 Claims**

1. A culture containing a viable cell mass of Bifodobacteria and lactic acid bacteria, which is obtained by incubating microorganisms of the genus Bifidobacterium, the genus Lactobacillus, and the species *Streptococcus thermophilus* in a medium containing milk as a main ingredient said culture immediately after incubating comprising:

(a) at least 1×10^8 cells per milliliter of the culture of *Streptococcus thermophilus* selected from the group consisting of *Streptococcus thermophilus* M-8202 (FERM BP-351), M-8203 (FERM BP-352), M-8204 (FERM BP-353), and M-8205 (FERM BP-354) and mixtures thereof having an oxygen uptake ability of at least 30 nano moles per milligram of dried cells of said *Streptococcus thermophilus* per minute as defined by the oxygen consumption which is determined according to Warbur's manometric method,

(b) at least 2×10^7 cells per milliliter of the culture of the genue Bifidobacterium and at least a 5% survival of the cells of the genus Bifidobacterium as expressed by the ratio in percent of the number of cells after storage at 5° C. for 7 days to the number of cells prior to storage, and

(c) at least 5×10^6 cells per milliliter of the culture of the genus Lactobacillus, and the viable cells of said *Streptococcus thermophilus* being at least 10 times that of the number of viable cells of the genus Lactobacillus.

4,588,596

READY-TO-EAT CEREALS

David P. Bone, Palatine; Kathryn M. Brophy, Cary; Robert M. Champion, Barrington; Robert J. Meschewski, East Dundee, and Craig W. McKinney, Schaumburg, all of Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Filed Oct. 24, 1983, Ser. No. 544,031
Int. Cl.[4] A21D *2/02;* A23L *1/164*
U.S. Cl. 426—290 **22 Claims**

1. In a method for providing a ready-to-eat cereal-derived product, which method comprises the steps of forming a cookie dough, shaping the cookie dough into individual bite size pieces, and baking the resulting shaped pieces to a moisture level of less than 10%, the improvement comprising including in the cookie product an additive member selected from the group consisting of free fatty acid, edible insoluble metallic salt of fatty acids and mixtures thereof, said additive

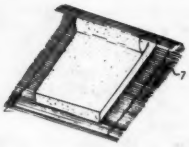
being added in an amount of at least about 0.2% based on the dry weight of cookie ingredients and in an amount sufficient to provide a bowl life of the resulting product of at least 3 minutes; and placing the resulting baked product in an aqueous solution, for serving as a ready-to-eat cereal.

4,588,597

PROCESS FOR PRODUCING A ROLLED CHEESE

Michel Caillé, Les Aix d'Angillon, France, assignor to Laiteries Hubert Triballat, D'Angillon, France

Continuation of Ser. No. 444,382, Nov. 26, 1982, Pat. No. 4,496,593, which is a continuation of Ser. No. 247,208, Mar. 24, 1981, abandoned. This application Nov. 7, 1984, Ser. No. 669,251
Claims priority, application France, Apr. 18, 1980, 80 07844
The portion of the term of this patent subsequent to Jan. 29, 2002, has been disclaimed.
Int. Cl.[4] A23C *19/06;* A23P *1/00*
U.S. Cl. 426—297 **8 Claims**



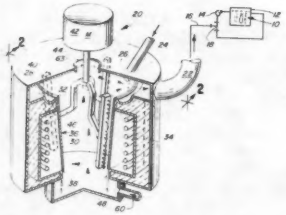
1. A process for producing a cheese with a layer of flavoring distributed in the cheese, comprising the successive steps of:
(a) molding uncooked fresh curds into a continuous, unbroken molded layer on a mat, said curds having a solids content of less than 40% by weight;
(b) draining said molded layer;
(c) placing a coating of herb containing flavoring on said molded layer to form a flavored layer;
(d) rolling said flavored layer into a spiral to produce a rolled product, wherein said mat supports said flavored layer during said rolling operation; and
(e) simultaneously refrigerating and further draining said rolled product.

4,588,598

METHOD AND COMPOSITION FOR SMOKING COMESTIBLE PRODUCTS AND SMOKED PRODUCTS PRODUCED THEREWITH

Carroll L. Griffith, Hinsdale, and Albert E. Nielson, Naperville, both of Ill., assignors to Griffith Laboratories U.S.A., Inc., Alsip, Ill.

Filed Nov. 30, 1984, Ser. No. 676,955
Int. Cl.[4] A23B *4/04*
U.S. Cl. 426—312 **18 Claims**



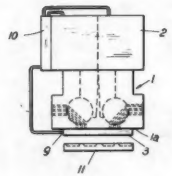
1. In a method for producing, from liquid smoke containing lower and higher boiling point constituents, a refined smoke vapor for imparting enhanced smokey flavor and color to comestible products, the improvement comprising:
spreading the liquid smoke on a heated surface to continuously selectively volatilize the lower boiling point constituents to produce a refined smoke vapor for application to the comestible products while leaving behind a residue containing higher boiling point constituents which exits at the edge of the surface,
wherein the surface is oriented so that the liquid smoke flows down it under the force of gravity, and wherein the surface is heated to a level such that the residue exits the surface at a temperature in the range of about 130° to 425° F.

4,588,599

METHOD OF CASTING CHOCOLATE

Renzo Cerboni, Milan, Italy, assignor to Carle & Montanari S.p.A., Milan, Italy

Filed Aug. 21, 1984, Ser. No. 643,003
Claims priority, application Italy, Feb. 9, 1984, 19532 A/84
Int. Cl.[4] A23G *1/21*
U.S. Cl. 426—515 **7 Claims**



1. A method of casting chocolate comprising the steps of:
(A) feeding fluidized chocolate into a metering device of a forming machine; said metering device having either reciprocating or rotary piston chambers which open into a plurality of delivery holes in the forming machine, the lower portion of the forming machine includes a bottom plate;
said bottom plate being formed with a discharge manifold channel into which there open, through connection grooves, a plurality of nozzles aligned with said delivery holes;
said discharge manifold channel extending annularly around the periphery of said bottom plate and having at least two spaced apart connection passageways for connection to an excess chocolate recovery system associated with the forming machine;
(B) delivering chocolate from all of the delivery holes of the forming machine into molds through said plurality of nozzles;
(C) continuously discharging excess chocolate over an amount required to fill said molds; and
(D) recoverying said excess chocolate from said bottom plate.

4,588,600

DRY PREMIX COMPOSITION FOR IMPARTING A FRIED APPEARANCE TO BAKED FOODS

Darrel R. Suderman, Middleburg Heights, Ohio, assignor to SCM Corporation, New York, N.Y.

Filed Apr. 18, 1983, Ser. No. 486,254
Int. Cl.[4] A21D *10/00*
U.S. Cl. 426—555 **23 Claims**

1. A dry, edible food coating premix composition consisting essentially of batter forming ingredients in effective amounts to form, on blending with liquid oil or shortening and water, a batter which, when applied to the surface of a food item, provides on baking a substantially continuous coating having the taste, and a variegated appearance and texture of a batter

coated deep or pan fried food item, said batter forming ingredients including, based on the weight of the composition

about 48–85% of a farinaceous material in flour form;

about 2–12% of a plastic or hard shortening or fat;

said flour and shortening or fat being mixed by impact mixing; and

at least one structure-building ingredient in an effective amount to form said substantially continuous coating.

4,588,601

METHOD OF PRODUCING PASTE PRODUCT LIKE LOBSTER'S MEAT

Tsutomu Maruyama; Mitugi Ikoma, and Kiyoe Satoh, all of Chiba, Japan, assignors to Kibun Company Limited, Tokyo, Japan

Continuation of Ser. No. 552,470, Nov. 16, 1983, abandoned. This application Jul. 22, 1985, Ser. No. 757,901

Int. Cl.[4] A22C *25/00*; A23L *1/325*

U.S. Cl. 426—574 **6 Claims**

1. A method of producing simulated lobster meat, comprising the steps of:

preparing a fish paste comprising a first protein mixture, said first protein mixture comprising minced fish meat;

heat coagulating said fish paste;

finely dividing said heat-coagulated fish paste;

mixing said finely divided, heat-coagulated fish paste with a second protein mixture as a binder in a weight ratio of 5:5 to 9:1 under a reduced pressure in the range of 0 to 260 mm Hg for about 5 to 20 minutes, wherein said first and second protein mixtures are the same or different;

molding the resulting mixture and heating the molded mixture sufficiently to set said molded mixture thereby obtaining said simulated lobster meat having a firm structure.

4,588,602

COLD WATER SOLUBLE GELATIN

James Brown, Huntington, Conn.; Peter E. Ellis, Riverdale, N.Y., and Marta J. Draper, Westport, Conn., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Filed Feb. 25, 1985, Ser. No. 704,784

Int. Cl.[4] A23L *1/04*

U.S. Cl. 426—576 **13 Claims**

1. A process for preparing a cold water soluble gelatin product comprising:

preparing an aqueous solution comprising water, gelatin, a sugar selected from the group consisting of corn syrup solids, maltodextrin and mixtures thereof, an acid and an amount of surface-active agent effective to increase dispersibility in the final product, the ratio by weight of said sugar to gelatin being in the range of about 2:1 to about 12:1, the amount of said acid being about 0.05 to about 0.5 parts by weight per part by weight of gelatin, and the total solids concentration of said solution being in the range of about 30% to about 70% by weight;

drying the solution so prepared; and

comminuting and screening the dried material so obtained to a particle size from about 20 to about 200 US mesh wherein at least about 40 percent by weight of the particles will pass through US mesh greater than 100.

4,588,603

METHOD FOR PREPARING A GELATINOUS FOOD PRODUCT STABILIZER

Miles D. Wofford, Rte. 1, Box 222C, Anthony, N. Mex. 88021

Filed Aug. 2, 1985, Ser. No. 761,784

Int. Cl.[4] A23L *1/04*

U.S. Cl. 426—576 **10 Claims**

1. A process for preparing a gelatinous food product stabilizer for maintaining food product integrity under freeze-thaw conditions or the like, including the steps of:

(a) combining between about 6 and 50 parts of non-halogenated water and about 1 part of about a 1 to 10% acidic solution with about 1 part of gelatinizing agent including granular gelatin at a temperature of between about 32° F. and 75° F. forming an acidic gelatinous aqueous solution,

(b) agitating said solution to disperse uniformly said gelatinizing agent throughout said solution forming a gelatinous slurry,

(c) maintaining said slurry at between about 32° F. and 75° F. until said gelatin granules have become partially swollen and hydrated,

(d) agitating and heating said slurry to a temperature of between about 90° F. and 115° F. until said gelatin granules are further swollen and hydrated and said slurry becomes smooth and non-granular to feel, and

(e) further heating and agitating said slurry until a uniformly clear solution is obtained.

4,588,604

SOLVENT FRACTIONATION PROCESS FOR OBTAINING TEMPERABLE CONFECTIONERY FAT FROM PALM OIL

Joseph S. Baker, and Rose M. Weitzel, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 21, 1984, Ser. No. 684,514

Int. Cl.[4] A23D *5/02*

U.S. Cl. 426—601 **9 Claims**

1. A process for obtaining a confectionery fat from palm oil which comprises the steps of:

(1) removing from palm oil by solvent fractionation one or more olein fractions to provide a first stearine fraction having less than about 10% combined SUU/UUU/SLS triglycerides by weight of the first stearine fraction;

(2) removing from the first stearine fraction by solvent fractionation one or more olein fractions to provide a second stearine fraction having less than about 8% SSO triglycerides by weight of the second stearine fraction; and

(3) removing from the second stearine fraction by solvent fractionation a third stearine fraction to provide an olein fraction containing a confectionery fat having less than about 2.5% SSS triglycerides by weight of the confectionery fat; wherein S is palmitic or stearic; and U is oleic (O) or linoleic (L).

4,588,605

METHOD OF AND ARRANGEMENT FOR APPLYING A STRIP-SHAPED POWDER LAYER ON A WELD SEAM OF CONTAINERS, AND A CONTAINER

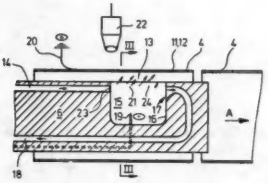
Siegfried Frei, St. Gallen, and Ernst Hohl, Wittenbach, both of Switzerland, assignors to Siegfried Frei, Gallen, Switzerland

Filed Mar. 14, 1984, Ser. No. 589,346

Claims priority, application Switzerland, Mar. 21, 1983, 1537/83

Int. Cl.[4] B05D *1/06*

U.S. Cl. 427—28 **8 Claims**



1. A method of forming and applying a substantially strip-shaped powder layer onto a weld seam of a can body, comprising the steps of:

supplying a powder composed of powder particles transported by a carrier gas and in the form of a substantially

bundled powder jet into a spray chamber of a spray head, wherein said spray chamber is open at a spray opening thereof towards the weld seam and is located opposite the weld seam;

establishing a pressure in the spray chamber which is lower than the pressure of the surrounding atmosphere to ensure retention of the bundled powder jet entering said spray chamber and to prevent formation of a spray cloud of the powder particles of said bundled powder jet composed of the powder transported by the carrier gas;

diverting at least part of the powder particles of the bundled powder jet from the spray chamber in the direction of the weld seam; and

depositing said diverted powder particles onto the weld seam in the form of a substantially strip-shaped powder layer.

4,588,606

ABRASION RESISTANT COATING AND METHOD FOR PRODUCING THE SAME

Madapusi K. Keshavan, and Merle H. Weatherly, both of Indianapolis, Ind., assignors to Union Carbide Corporation, Danbury, Conn.

Division of Ser. No. 543,142, Oct. 18, 1983, Pat. No. 4,526,618. This application Mar. 8, 1985, Ser. No. 709,901

Int. Cl.[4] B05D *1/08*

U.S. Cl. 427—34 **3 Claims**

1. A method for producing an abrasive resistant coating on a substrate which comprises: providing a powder composition comprising tungsten carbide and a boron-containing alloy or a mixture of alloys with a total composition of from about 6.0 to 18.0 weight percent boron, 0 to 6 weight percent silicon, 0 to 20 weight percent chromium, 0 to 5 weight percent iron and the balance nickel; the tungsten carbide comprising about 78 to 88 weight percent of the entire composition; and then depositing the powder composition by plasma arc spray onto said substrate.

4,588,607

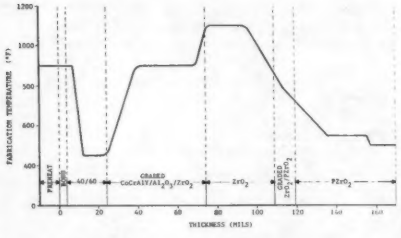
METHOD OF APPLYING CONTINUOUSLY GRADED METALLIC-CERAMIC LAYER ON METALLIC SUBSTRATES

Alfred P. Matarese, North Haven, and George S. Bosshart, Vernon, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Nov. 28, 1984, Ser. No. 675,806

Int. Cl.[4] B05D *1/08*

U.S. Cl. 427—34 **11 Claims**



1. A method for applying a graded ceramic-metallic layer to a metallic substrate including the steps of:

a. preheating the substrate to an elevated temperature;

b. applying a metallic bond coat;

c. reducing the substrate temperature;

d. applying a graded metallic-ceramic layer, by depositing a multiplicity of thin layers of material, said layers having a largely metallic composition at the bond coat interface and a composition which increases in ceramic content and decreases in metallic content through the thickness of the graded layer, increasing the substrate temperature in approximate proportion to the ceramic content with the substrate temperature exceeding that achieved in step a. when the graded layer composition is essentially all ceramic said substrate temperature increasing being uninterrupted by periods of decreasing temperature prior to termination of the process

whereby the resultant prestressed graded layer is capable of resisting severe thermal conditions without failure.

11. A method for producing a gas turbine engine air seal having a metallic substrate including the steps of:

a. preheating the substrate to an elevated temperature;

b. applying a metallic bond coat;

c. reducing the substrate temperature;

d. applying a graded metallic-ceramic layer by codepositing a mixture of metal and ceramic particulate material, starting with a predominately metallic mix at the bond coat interface and finishing with a substantially ceramic composition, by measuring the mass flow rates of the respective powders during the process and adjusting the mass flow rate according to a predetermined schedule, while increasing the substrate temperature in approximate proportion to the ceramic content in the mixture being sprayed with the substrate temperatures at conclusion of the graded layer deposition substantially exceeding the substrate temperature at which the bond coat was applied said substrate temperature increasing being uninterrupted by periods of decreasing temperature prior to termination of the process;

e. applying a layer of pure ceramic over the graded layer by plasma spraying, providing intentional porosity in the outer portion of the ceramic layer by co-spraying the ceramic material with a fugitive material, and gradually reducing the substrate temperature while depositing the pure ceramic layer; and

f. varying the distance between the plasma gun and the substrate during the process so as to produce a more dense coating near the substrate and a less dense coating away from the substrate.

4,588,608

HIGH STRENGTH, WEAR AND CORROSION RESISTANT COATINGS AND METHOD FOR PRODUCING THE SAME

John E. Jackson, Brownsburg; Thomas A. Adler; Jean M. Quets, both of Indianapolis, and Robert C. Tucker, Jr., Brownsburg, all of Ind., assignors to Union Carbide Corporation, Danbury, Conn.

Division of Ser. No. 546,480, Oct. 28, 1983, Pat. No. 4,519,840. This application Mar. 18, 1985, Ser. No. 712,649

Int. Cl.[4] B05D *1/08*

U.S. Cl. 427—34 **10 Claims**

1. In a method for coating a substrate wherein a powdered coating material is suspended within a high temperature, high velocity gaseous stream and heated to a temperature at least close to the melting point thereof, said gaseous stream being directed against a surface of said substrate to deposit said powdered coating material and form a coating thereon, the improvement for increasing the toughness and strength of said coating, said improvement comprising a powdered coating material having a composition such that the coating deposited onto said substrate consists essentially of from about 11.0 to about 18.0 weight percent cobalt, from about 2.0 to about 6.0 weight percent chromium, from about 3.0 to about 4.5 weight percent carbon and the balance tungsten.

4,588,609

PROCESS FOR THE PHOTOCHEMICAL VAPOR DEPOSITION OF AROMATIC POLYMERS

Richard N. Leyden, 22024 Alta Dr., Topanga, Calif. 90290, and James T. Hall, 1419 S. Irena Ave., Redondo Beach, Calif. 90277

Filed Nov. 26, 1984, Ser. No. 674,619
Int. Cl.[4] B05D 3/06
U.S. Cl. 427—54.1 14 Claims

1. A process for forming on the surface of a substrate a layer of a chosen organic polymer comprising directly bonded repeating arylene groups, comprising exposing said substrate to a selected vapor phase reactant comprising said arylene group having substituted thereon an element or radical capable of being photodissociated from said arylene group, and radiation of a predetermined wavelength to bring about the photodissociation of said element or radical from said arylene group and the formation of said chosen polymer which deposits on said surface of said substrate, wherein said polymer is substantially free of said element or radical.

8. A process for forming on the surface of a substrate a layer of a chosen conductive polymer comprising directly bonded repeating arylene groups and a selected dopant comprising the steps of:

(a) exposing said substrate to a selected vapor phase reactant comprising said arylene group having substituted thereon an element or radical capable of being photodissociated from said arylene group, and radiation of a predetermined wavelength to bring about the photodissociation of said element or radical from said arylene group and the formation of an undoped polymer comprising directly bonded repeating arylene groups, which deposits as a layer on said surface of said substrate wherein said polymer is substantially free of said element or radical; and

(b) introducing a selected dopant material into said layer of said undoped polymer to thereby form said conductive polymer.

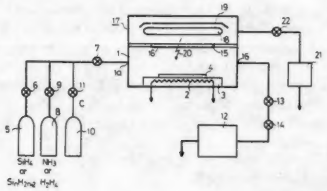
13. A process for forming on the surface of a substrate a layer of a chosen conductive polymer comprising directly bonded arylene groups and a selected dopant, comprising exposing said substrate to a selected vapor phase reactant comprising the monomer precursor of said repeating arylene groups and a selected vapor phase dopant material in the presence of radiation of a predetermined wavelength to bring about the formation of said conductive polymer.

4,588,610

PHOTO-CHEMICAL VAPOR DEPOSITION OF SILICON NITRIDE FILM

Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Tokyo, Japan

Filed May 24, 1984, Ser. No. 613,612
Claims priority, application Japan, May 24, 1983, 58-91278
Int. Cl.[4] B05D 3/06
U.S. Cl. 427—54.1 7 Claims



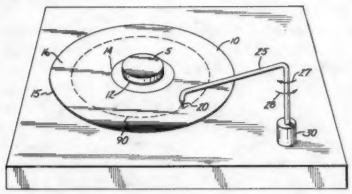
1. A photo-chemical vapor deposition which includes the step of irradiating a source gas by light to deposit the silicon nitride (Si_3N_4) film on a substrate, characterized in that a gas mixture of monosilane (SiH_4) gas and ammonia (NH_3) or hydrazine (N_2H_4) gas but without mercury vapor is used as the source gas, that ultraviolet light having a wavelength of 200 nm or less is used as the light, that the reaction chamber is held under a pressure of 0.1 to 10 Torr, and that the substrate is held at 100–500° C., whereby the silicon nitride film is deposited with a charge density of 1×10^{11} cm^{-2} or less.

4,588,611

DISK STRIPPING AND COATING PROCESS

Bahram Shadzi, Richfield, Minn., assignor to Magnetic Peripherals Inc., Minneapolis, Minn.

Continuation of Ser. No. 585,791, Mar. 2, 1984, abandoned, which is a continuation-in-part of Ser. No. 504,638, Jun. 15, 1983, abandoned. This application Dec. 4, 1984, Ser. No. 677,936
Int. Cl.[4] H01F 10/02
U.S. Cl. 427—129 10 Claims



1. A method of stripping a defective magnetic media layer comprising iron oxide particles suspended in a dried, uncured polymeric binder composition from a disk to prepare said disk for recoating, said disk having an outside diameter and an inside diameter, comprising the steps of:

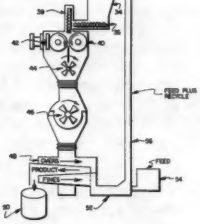
rotating the disk at a rotational speed of at least 2500 rpm, and dispensing a liquid stream of magnetic medium material comprising iron oxide particles suspended in a liquid polymeric binder and a solvent, from a nozzle upon said media layer of said disk, starting at said outside diameter of said disk and moving to said inside diameter of said disk, whereby said media layer is stripped from said disk as said media stream nozzle moves from said outside diameter to said inside diameter.

4,588,612

PRETREATMENT IN ENCAPSULATION PROCESS

Douglas W. Perkins, Medina, and Anthony V. Petricca, Rocky River, both of Ohio, assignors to SCM Corporation, New York, N.Y.

Filed Apr. 24, 1985, Ser. No. 726,408
Int. Cl.[4] B05D 1/22
U.S. Cl. 427—213 6 Claims



1. A process for encapsulating materials which are difficult to fluidize in a fluidized bed reactor comprising the steps of

(1) compacting said materials into a plurality of flat chips;

(2) grinding said chips into particles having an average particle size in the range of about 20 to about 400 mesh size, U.S. Standard Sieve;

(3) forming a fluid bed of the particles of step (2) in a fluid bed spray reactor;
(4) applying a spray of encapsulating coating to the surface of said particles in said reactor, encapsulating said particles;
(5) withdrawing said encapsulated particles from said reactor.

4,588,613

PROCESS FOR REDUCING POLYMER BUILDUP

Shung-Chung Liau; Kuo-Shu Tseng, both of Delaware City, Del., and Yen H. Huang, Florham Park, N.J., assignors to Formosa Plastics Corporation, Taiwan, China

Filed Oct. 10, 1984, Ser. No. 659,359
Int. Cl.[4] C08F *2/00*
U.S. Cl. 427—230 **24 Claims**

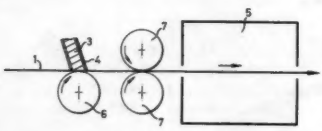
1. A process for reducing the buildup of polymers on the interior surfaces of a polymerization reaction vessel during a polymerization reaction, said process comprising the steps of:
(a) coating said surfaces with a condensation polymer of a polyhydric phenol and an aldehyde wherein the polyhydric phenol is at least one of the group consisting of resorcinol, catechol, hydroquinone, pynogallol, phloroglucinol of 1, 2 4-benzenetriol;
(b) drying the solvent from said coating; and
(c) applying a crosslinking agent to said polymer coating thereby stabilizing said polymer coating toward the polymerization reaction medium.

4,588,614

PSEUDOPLASTIC GEL TRANSFER

Alfred E. Lauchenauer, Horn, Switzerland, assignor to Adnovum AG, Horn, Switzerland

Continuation of Ser. No. 435,530, Oct. 20, 1982, abandoned. This application Jul. 2, 1984, Ser. No. 627,482
Claims priority, application United Kingdom, Oct. 20, 1981, 8131594; Feb. 19, 1982, 8204990
Int. Cl.[4] B05D *3/02, 3/12, 5/00, 7/24*
U.S. Cl. 427—243 **9 Claims**



1. A method of forming a pseudoplastic gel and causing the penetration of said pseudoplastic gel into a porous structure, comprising the steps of: combining an active agent, at least one evaporable solvent therefor, and a given concentration of at least one gel forming agent to form a pseudoplastic gel, applying said pseudoplastic gel in a layer to a porous structure to be treated during movement of said porous structure, applying shear to said layer to cause said pseudoplastic gel to penetrate said porous structure to a depth determined by said applied shear, and subsequent to applying said shear to said layer, evaporating the solvent from said penetrated pseudoplastic gel.

4,588,615

RESIN IMPREGNATION METHOD

Malcolm Otty, 27 Column Road, West Kirby, Merseyside, Liverpool, United Kingdom

Filed Nov. 2, 1984, Ser. No. 667,732
Claims priority, application United Kingdom, Nov. 2, 1983, 8329289
Int. Cl.[4] B05D *3/00, 1/18*
U.S. Cl. 427—294 **15 Claims**

1. A method for resin impregnating a fabric comprising the steps of:
forming a bath of resin having a liquid resin surface;
evacuating a space above said surface; and

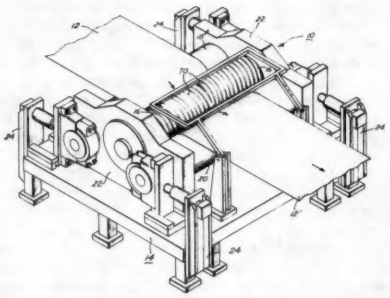
placing said fabric horizontally on said surface with one side of said fabric exposed to said evacuated atmosphere, whereby said resin supports and impregnates said fabric.

4,588,616

METHOD AND APPARATUS FOR PRESSURE SATURATION OF SUBSTRATE

Howard K. Menser, Plymouth, Ind., assignor to Miply Equipment Inc., South Bend, Ind.

Continuation-in-part of Ser. No. 641,568, Aug. 16, 1984, abandoned. This application Oct. 17, 1984, Ser. No. 661,913
Int. Cl.[4] B05D *1/18;* B05C *3/12*
U.S. Cl. 427—430.1 **48 Claims**



1. A pressure saturator for impregnating a substrate with a saturant, comprising:
a. a block member having a first surface;
b. conveying means for moving the substrate into and out of said saturator;
c. a mandrel rotatably disposed between said conveying means with a selected portion thereof cooperating with the first surface to define a chamber between the first surface and the mandrel sized to receive the substrate; and
d. means for supplying a saturant to the chamber;
e. said chamber having a generally converging depth in the direction of travel of the substrate with a relatively deeper entrance region and a relatively shallower exit region for generating a higher pressure in the saturant in the exit region than the entrance region in order to force the saturant into the substrate.

20. A method of impregnating a substrate with a liquid saturant, using a mandrel and a peripheral saturant chamber of a generally decreasing radial depth from its entrance to its exit such that the saturant chamber converges in depth from a relatively large depth at its entrance to a relatively smaller depth at its exit, the steps comprising:
a. introducing the substrate and the liquid saturant into the chamber;
b. rotating the mandrel in the direction of the decreasing depth of the chamber;
c. moving the substrate along with the periphery of said rotating mandrel through said chamber from the entrance to the exit at a selected rate, said selected rate effective to pressurize the liquid saturant in the chamber, thereby forcing saturant into the substrate to create an inpregnated substrate; and
d. withdrawing the impregnated substrate from said chamber through said exit.

4,588,617

PROCESS FOR PRODUCING CURED EPOXY RESIN SPHERICAL PARTICLES

Koichiro Oka, Ibaraki, Japan, assignor to Toray Industries, Inc., Tokyo, Japan

Filed Sep. 17, 1984, Ser. No. 651,362
Int. Cl.[4] B05D *1/18*; C08L *63/00*; D06P *5/00*
U.S. Cl. 427—443.1 15 Claims

1. A process for producing cured epoxy resin spherical particles having an average particle size not larger than 50 μm, which comprises mixing an uncured epoxy compound, a surface-active agent and water to prepare an emulsion of said uncured epoxy compound, said uncured epoxy compound comprising 50 to 100% by weight of a compound having at least two epoxide groups; adding a water-soluble amine to said emulsion; and curing said uncured epoxy compound.

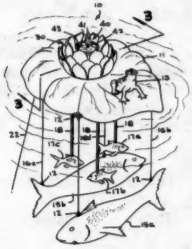
15. The process for producing cured epoxy resin spherical particles as defined in claim 1, wherein said spherical particles are further subjected to electroless plating.

4,588,618

ORNAMENTAL FLOATING APPARATUS

Henry S. Wolfe, St. Petersburg, Fla., assignor to Gulf Coast Aqua Leisure, Inc., Clearwater, Fla.

Filed Sep. 18, 1984, Ser. No. 652,622
Int. Cl.[4] A41G *1/00*; G09F *19/02*
U.S. Cl. 428—7 20 Claims



1. An ornamental floating apparatus comprising:

(a) a first body buoyant in water and configured to have rotational movement about a horizontal axis when struck by ripples,

(b) at least one second body non-buoyant in water, and

(c) connecting means extending downwardly from said first body

(i) for supporting said second body from said first body when said first and second bodies are in water and

(ii) for causing rotational movement of said second body about a horizontal axis upon rotational movement of said first body about a horizontal axis.

4,588,619

METHOD FOR CONVERTING A LENS

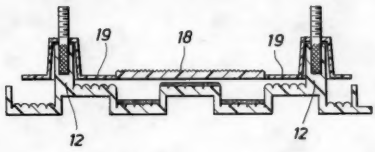
Walter J. Fiscus, 11914 Blue Spruce, 77066, and Ronnie L. Byrum, 1501 Azalea Trace, both of Houston, Tex. 77066

Filed Aug. 27, 1984, Ser. No. 644,854
Int. Cl.[4] B32B *31/00*
U.S. Cl. 428—31 12 Claims

1. A method for converting a translucent motor vehicle lens having an exterior surface and a textured interior surface into a lens through which light can be reflected, the method comprising: grinding the textured interior surface of said lens to a reduced height;

applying multiple coats of a transparent filler to reduce the texturing of said interior surface of said lens;

applying a translucent colored stain to the exterior surface of said lens and to the interior surface of said lens; and



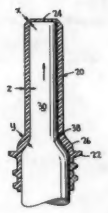
affixing a reflective panel to said lens adjacent said interior surface.

4,588,620

PARISON FOR MAKING MOLECULARLY ORIENTED PLASTIC BOTTLES

John A. Marcinek, Westfield, Mass., assignor to Emhart Industries, Inc., Farmington, Conn.

Division of Ser. No. 567,517, Jan. 3, 1984, Pat. No. 4,521,369, which is a division of Ser. No. 56,426, Jul. 10, 1979, Pat. No. 4,432,530, which is a continuation-in-part of Ser. No. 863,746, Dec. 23, 1977, abandoned. This application Mar. 29, 1985, Ser. No. 717,799
Int. Cl.[4] B65D *1/00*
U.S. Cl. 428—35 3 Claims



1. A plastic parison having a bottom wall portion, a sidewall portion, a shoulder portion and a neck finish, said bottom wall portion having a flat area and there being an annular corner area joining said bottom wall and sidewall portions, said bottom wall portion having a thickness less than the thickness of said sidewall portion with there being a rapid transition from said flat of said bottom wall to said sidewall portion with said sidewall thickness being substantially constant from said annular corner area to said shoulder portion.

4,588,621

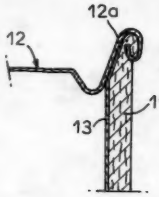
CONTAINER BODY OF THE COMPOSITE TYPE AND CONTAINER COMPRISING SAID BODY

Gérard Bunel, LeHavre; Jean-Paul Lévy, Sarrebourg, and Christian Martinez, Harfleur, all of France, assignors to Compagnie Francaise de Raffinage, Paris, France

PCT No. PCT/FR84/00027, § 371 Date Oct. 10, 1984, § 102(e) Date Oct. 10, 1984
PCT Filed Feb. 8, 1984, Ser. No. 673,760
Claims priority, application France, Feb. 10, 1983, 83 02124
Int. Cl.[4] B65D *15/06*
U.S. Cl. 428—35 20 Claims

1. A composite container body having an inner surface and at least one opening, an outer surface and an edge between the inner and outer surface, which comprises a multi-layer complex on the inner surface containing a metallic film formed of a spirally wound metal ribbon and an adhesive layer which is adhered to the metallic film, covers the entire inner surface of the container body and is formed of at least one copolymer obtained by polymerization of a monoolefin and grafting with

a monoethylenic carboxylic acid, the adhesive layer being adapted to adhere directly to a metallic surface of a closure for



the opening such that a tight seal is formed between the container body and the closure.

4,588,622

FIBER-REINFORCED PRESSURE CONTAINER

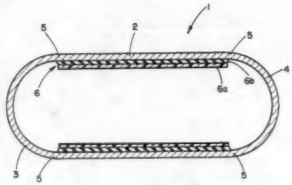
George Sukarie, Karlsfeld-Rothschwaige, Fed. Rep. of Germany, assignor to M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft, Postfach, Fed. Rep. of Germany

Filed Jun. 12, 1985, Ser. No. 744,103

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1984, 3426158

Int. Cl.⁴ F17C *1/02;* **B65H** *81/00*

U.S. Cl. 428—35 **8 Claims**



1. A pressure container, comprising:

an outside shell including

(i) a central, cylindrical portion having first and second axial ends,

(ii) first and second domed end portions located axially outward of and closing the first and second axial ends of the cylindrical portion, and

(iii) first and second transition portions, the first transition portion axially extending between the first axial end of the cylindrical portion and the first domed end portion, and the second transition portion axially extending between the second axial end of the cylindrical portion and the second domed end portion; and

a reinforcing section including

(i) a cylindrical inner layer hving a substantially uniform radial width, and first and second open axial ends coplanar with the first and second axial ends, respectively, of the cylindrical portion, and

(ii) a cylindrical outer layer radially positioned between and against the inner layer and the outside shell, and having first and second chamfered, axial end edges, said first and second chamfered edges slanting radially and axially outward, beyond the first and second axial ends, respectively, of the inner layer of the reinforcing section to reinforce the first and second transition portions of the outside shell.

4,588,623

METAL PLATED POLY(ARYL ETHER) CONTAINING ARTICLES

Tyler F. Hartsing, Jr., Westfield; Marvin E. Sauers, Belle Mead, and Lloyd M. Robeson, Whitehouse Station, all of N.J., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 655,434, Sep. 28, 1984, abandoned. This application May 16, 1985, Ser. No. 734,692

Int. Cl.⁴ F16L *9/12*

U.S. Cl. 428—36 **19 Claims**

1. A metal plated poly(aryl ether) containing article, said poly(aryl ether) comprising a blend of a poly(aryl ether) polymer, a styrene copolymer, acrylic copolymer and a compatibilizing in amounts of from about 0.5 to about 20 weight percent of a polyhydroxyether.

4,588,624

ARTICLES EXHIBITING A BIOCOMPATIBLE SURFACE LAYER

Bo H. Nygren, Billdal, and Johan E. Stenberg, Göteborg, both of Sweden, assignors to Astra Meditec AB, Sweden

PCT No. PCT/SE83/00191, § 371 Date Jan. 13, 1984, § 102(e) Date Jan. 13, 1984, PCT Pub. No. WO83/03977, PCT Pub. Date Nov. 24, 1983

PCT Filed May 13, 1983, Ser. No. 576,377

Claims priority, application Sweden, May 14, 1982, 8203029

Int. Cl.⁴ B32B *1/08, 23/04, 27/38*

U.S. Cl. 428—36 **7 Claims**

1. An article exhibiting at least one surface of glass, silicon, aluminum or silicone rubber coated with a biocompatible surface layer, wherein the biocompatible surface layer consists of a polysaccharide containing at least one hydroxyl group and wherein the polysaccharide is covalently bound to said surface of glass, silicon, aluminum or silicone rubber by means of a silane containing at least one epoxy group.

4,588,625

LATEX RUBBER COATED ASBESTOS-CEMENT PRODUCTS

Victor Puskar, Basking Ridge, N.J., assignor to ASARCO Incorporated, New York, N.Y.

Division of Ser. No. 448,482, Dec. 10, 1980, Pat. No. 4,489,109. This application Oct. 2, 1984, Ser. No. 656,837

Int. Cl.⁴ F16L *9/08;* **B32B** *13/12*

U.S. Cl. 428—36 **11 Claims**

1. An asbestos-cement product having bonded thereto a thin protective coating of a cured latex composition comprising a styrene-butadiene copolymer, the product being formed by the process comprising:

forming the asbestos-cement product from an aqueous slurry of asbestos fibers and cement on a means for forming a product of predetermined dimension;

removing the product from the means for forming the product;

coating the product with a latex composition comprising a styrene-butadiene copolymer to a predetermined thickness;

autoclaving the coated product for a predetermined time at a predetermed pressure and temperature in order to bond the latex composition to the asbestos-cement product;

cooling the product to a predetermined temperature.

4,588,626

BLIND-SIDE PANEL REPAIR PATCH

Rudy L. Cologna, Bellevue; Melvin D. Eng, Seattle, and Edgar P. King, Kent, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Oct. 29, 1984, Ser. No. 665,810

Int. Cl.⁴ B32B *3/10;* **E04G** *23/02*

U.S. Cl. 428—63 **34 Claims**

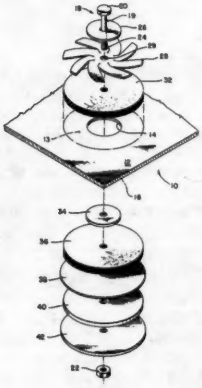
1. A blind-side panel patch for repairing a damaged panel of composite material, wherein the damaged section has been cut out, leaving a circular hole of certain diameter, comprising:

a circular disc having a central hole and a slit extending from

the outer circumferential edge of said disc to said central hole, and having an outside diameter smaller than twice the diameter of said panel hole, and larger than the diameter of said panel hole;

a bolt having a shank sized to fit through said hole in said disc;

a plurality of fabric plies adapted to be impregnated with a bonding agent and inserted on said bolt adjacent said disc and, when said disc is twisted and one edge inserted into said panel hole and turned therethrough by revolving said bolt around the periphery of said panel hole, said fabric plies may be pushed through said panel hole and pressed



by said disc against said blind-side of said panel on the marginal regions around said panel hole, and against a plug of material filling said hole;

a plurality of fabric plies adapted to be impregnated with a bonding agent and impaled on said bolt against the near-side of said panel opposite to said blind-side;

a rigid support plate having a central aperture sized to receive said bolt shank; and

a nut for threading on said bolt shank and torquing against said support plate for squeezing said disc and said support plate against said plies to compress said plies against said panel to express the voids out of said fabric plies and hold said plies in place while said bonding agent cures.

4,588,627

DEFLECTOR FOR VEHICLE BODY COMPONENTS

Robert A. Isaksen, Chardon; David E. Frappier, Chagrin Falls, and Wallace R. Jones, Waite Hill Village, all of Ohio, assignors to The Excello Specialty Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 415,228, Sep. 7, 1982, Pat. No. 4,469,732. This application May 3, 1984, Ser. No. 606,900

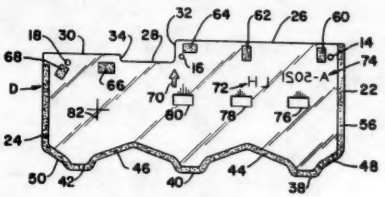
The portion of the term of this patent subsequent to Sep. 4, 2001, has been disclaimed.

Int. Cl.[4] B32B *3/02, 3/10*

U.S. Cl. 428—80 **34 Claims**

1. A reusable deflector for application to a vehicle panel to prevent water or dust from entering the vehicle body comprising:

a flat and flexible sheet of plastic material having a peripheral shape generally matching the peripheral configuration of at least some portion of a vehicle panel, said sheet having top, bottom, and opposite side edges and a single permanently tacky pressure-sensitive adhesive bonded to



one face of said sheet in strips adjacent said edges and covering a minor portion of the surface of said one face.

4,588,628

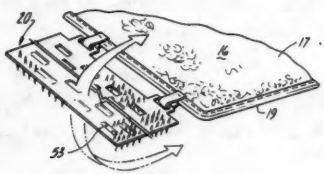
FLOOR MAT

David W. Roth, Grosse Pointe Park, Mich., assignor to The 2500 Corporation, Birmingham, Mich.

Continuation-in-part of Ser. No. 444,986, Nov. 29, 1982, Pat. No. 4,481,240, which is a continuation-in-part of Ser. No. 131,262, Mar. 17, 1980, Pat. No. 4,361,610. This application Oct. 9, 1984, Ser. No. 658,643

Int. Cl.[4] B32B *3/06;* **B60J** *9/00*

U.S. Cl. 428—85 **26 Claims**



1. A floor mat construction including:

(a) at least one carpeted surface;

(b) mounting means for securing a retainer to said floor mat; and

(c) a retainer having bristles on at least one side thereof hingedly attached to said floor mat by said mounting means for rotation through approximately 360°.

4,588,629

EMBOSSED FABRICS TO GIVE CONTRASTING COLORS

Derek P. Taylor, The Old Yells Farm, Hilton La., Essington, Near Wolverhampton, England

Filed Jul. 1, 1985, Ser. No. 750,183

Claims priority, application United Kingdom, Jul. 3, 1984, 8416850; Aug. 24, 1984, 8421563

Int. Cl.[4] B32B *33/00*

U.S. Cl. 428—88 **7 Claims**

1. An embossed fabric comprising a coating of fibres of one or more colours on a substrate of thermo-plastic material which presents a base colour which contrasts with the fibres, wherein in selected areas the coating fibres have been compressed by the application of heat and pressure into the sub-

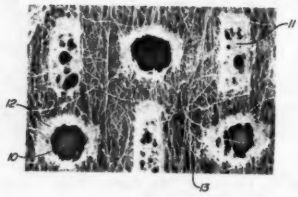
strate so as at least partially to reveal a colour contrasting with that of the fibres adjacent to said selected areas.

4,588,630

APERTURED FUSIBLE FABRICS

Charles J. Shimalla, Kendall Park, N.J., assignor to Chicopee, New Brunswick, N.J.

Filed Jun. 13, 1984, Ser. No. 620,193
Int. Cl.[4] B32B *3/10*
U.S. Cl. 428—131 22 Claims



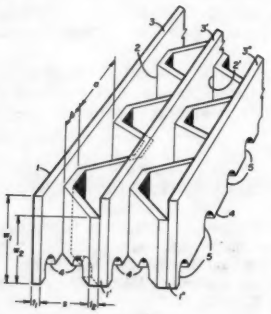
1. An apertured non-woven fabric comprising a web of thermoplastic fibers, said fabric having a multiplicity of fused patterned regions and adjacent substantially non-fused regions, there being apertures formed within a plurality of said fused patterned regions but not within said adjacent regions, each aperture being surrounded by a perimeter of fused thermoplastic material in which the original fibrous formation is no longer present.

4,588,631

SUPPORT FOR TUBESHEETS IN HOLLOW FIBER PERMEATORS

George B. Clark, Clayton, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jan. 28, 1983, Ser. No. 461,824
Int. Cl.[4] B32B *3/28*
U.S. Cl. 428—166 9 Claims



1. A foraminous body having utility as an effluent-conveying support between a backing member and a hollow fiber tubesheet, said body being a plate comprising

a plurality of tape wraps disposed, on edge, in generally concentric array and spaced radially apart; the edges of said wraps defining opposed first and second major surfaces of said plate, and

spacing means disposed between and in contact with said wraps and adapted to allow flow of fluid through said plate by passing from said first surface to said second surface between said wraps and through said spacing means,

said spacing means not contacting said first surface.

4,588,632

INDUSTRIAL FABRICS

Bryan J. Gisbourne, and Paul F. Myerscough, both of Blackburn, England, assignors to Scapa-Porritt Limited, Lancashire, England

Filed Oct. 12, 1984, Ser. No. 660,220
Claims priority, application United Kingdom, Oct. 19, 1983, 8328014
Int. Cl.[4] B32B *5/32, 7/00;* D03D *23/00*
U.S. Cl. 428—212 23 Claims

1. A method of reducing the permeability of a paper machine dryer fabric in whole or in part comprising the steps of introducing liquid foam or foam forming material into the fabric, and effecting setting or curing of such material, so as to form a continuous layer of flexible open cell elastomeric foam within the fabric, the foam existing wholly within the fabric and one face, at least, thereof being arranged to be contiguous or substantially contiguous with a corresponding surface of the fabric.

4,588,633

POLYETHYLENE MICROPOROUS MEMBRANE OF ULTRA HIGH MOLECULAR WEIGHT

Koichi Kono; Shoichi Mori; Kenji Miyasaka, and Jyoichi Tabuchi, all of Saitama, Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 29, 1985, Ser. No. 728,806
Claims priority, application Japan, Apr. 27, 1984, 59-83872
Int. Cl.[4] B32B *27/32*
U.S. Cl. 428—220 3 Claims

1. A polyethylene microporous membrane consisting of polyethylene having a weight average molecular weight of at least 5×10^5, and having a thickness of at most 10 μm, a breaking strength of at least 200 kg/cm^2 and a porosity of at least 30%.

4,588,634

COATING FORMULATION FOR INORGANIC FIBER MAT BASED BITUMINOUS ROOFING SHINGLES

Charles A. Pagen, Hurst, Tex.; George Stepien, Jr., Montclair, N.J., and Paul A. Morris, Bedford, Tex., assignors to The Flintkote Company, Stamford, Conn.

Division of Ser. No. 520,844, Aug. 5, 1983, abandoned. This application Jan. 9, 1985, Ser. No. 690,370
Int. Cl.[4] B32B *5/16;* D04H *1/08;* B05D *3/02;* G08K *7/14*
U.S. Cl. 428—283 10 Claims

1. A roofing shingle, comprising a substrate and a coating formulation applied thereto, wherein said substrate is an inorganic fiber mat and said coating formulation comprises:

(a) about 1% to 74% of an elastomeric polymer composition, said polymer being block polymerized;

(b) about 10% to 83% of a bitumen composition;

(c) about 15% to 88% of a mineral stabilizer; and

(d) about 1% to 74% of a recycled or reclaimed rubber.

4,588,635

SYNTHETIC DOWN

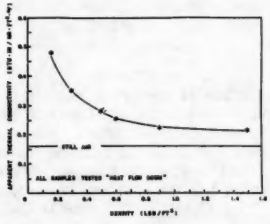
James G. Donovan, Norwell, Mass., assignor to Albany International Corp., Albany, N.Y.

Filed Sep. 26, 1985, Ser. No. 780,384
Int. Cl.[4] D04H *1/58*
U.S. Cl. 428—288 9 Claims

1. A synthetic fiber batt thermal insulator material, which comprises a blend of

(a) 80 to 95 weight percent of spun and drawn, crimped, staple synthetic polymeric microfibers having a diameter of from 3 to 12 microns; and

(b) 5 to 20 weight percent of synthetic polymeric staple macrofibers having a diameter of from more than 12, up to 50 microns, said batt having the following characteristics:



a radiation parameter defined as the intercept on the ordinate axis at zero density of a plot of $k_C P_F$ against P_F less than 0.075 (Btu-in/hr-ft^2-°F.) (lb/ft^3)

a density P_F from 0.2 to 0.6 lb/cu ft and an apparent thermal conductivity K_C measured by the plate-to-plate method according to ASTM C518 with heat flow down of less than 0.5 Btu-in./hr ft^2°F.

4,588,636

MAGNETIC RECORDING MEDIUM

Ryuji Shirahata; Akio Yanai, and Tatsuji Kitamoto, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 12, 1982, Ser. No. 348,611

Claims priority, application Japan, Feb. 13, 1981, 56-19906

Int. Cl.^{4} H01F *10/02*

U.S. Cl. 428—336 **6 Claims**

1. A magnetic recording medium, comprising:

a non-magnetic support base; and

a thin ferromagnetic metal film formed on a surface of said base, said film being formed by vacuum vapor deposition and said film being comprised of 75 weight percent or more Co and 0.05 to 3.0 weight percent Mg.

4,588,637

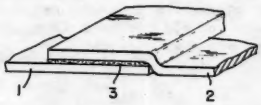
ADHESIVE COMPOSITION

Jessie T. Chiu, Bellevue, Wash., assignor to Rockcor, Inc., Redmond, Wash.

Division of Ser. No. 482,220, Apr. 5, 1983, abandoned. This application Mar. 5, 1984, Ser. No. 586,065

Int. Cl.^{4} C09J *7/02*

U.S. Cl. 428—355 **13 Claims**



1. A membrane roofing adhesive tape comprising a layer of adhesive material, said adhesive material comprising a cured butyl rubber based composition formed by compounding a minor portion of a butyl rubber copolymer, a curing agent for said butyl rubber, at least 2 parts carbon black per hundred parts butyl rubber and a major portion of a tackifier compatible with butyl rubber and forming and curing the composition in a strip, the composition being compounded such that upon being cured it has a tensile strength of at least 50 psi, an elongation of at least 600%, a modulus at 30% elongation of not more than 12 psi, a modulus at failure of not more than 20 psi, a shear strength of at least 15 psi and a peel strength of at least 2 pounds per inch.

4,588,638

DUNNAGE MATERIAL

Blair E. Dolinar, St. Louis, Mo., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 604,096, Apr. 26, 1984, abandoned. This application Apr. 19, 1985, Ser. No. 725,022

Int. Cl.^{4} B32B *27/00, 27/08*

U.S. Cl. 428—339 **15 Claims**

1. A loose fill packing material comprising a plurality of expanded, resilient, thermoplastic, synthetic resinous dunnage particles which particles comprise an amount of an additive deposited on at least a portion of an outer surface area of a majority of said dunnage particles which additive is selected from the group consisting of synthetic polymer latexes, pressure sensitive adhesives, glues, low molecular weight polymers which have a ring and ball softening point, as determined in accordance with American Society for Testing and Materials Test E-28, of greater than 30° Centigrade, waxes, contact cements, urethane adhesives, starch derived adhesives and protein derived adhesives, and is deposited on the dunnage particles after expansion of said dunnage particles and which additive results in the packing material having improved cushioning properties and reduces the tendency of articles to migrate through the dunnage particles, wherein the particles have an average maximum cross-sectional dimension of at least 0.5 inch.

4,588,639

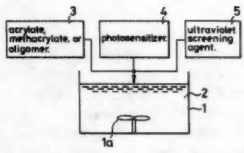
MICRO-CAPSULES AND METHOD OF PREPARING SAME

Masayoshi Ozono, Hachioji, Japan, assignor to Three Bond Co., Ltd., Tokyo, Japan

Filed Sep. 16, 1983, Ser. No. 532,983

Int. Cl.^{4} B01J *13/02*

U.S. Cl. 428—402.22 **13 Claims**



1. A method of preparing micro-capsules, comprising the steps of

dispersing a composition comprising a hydrophobic acrylate or methacrylate monomer or oligomer capable of polymerization upon exposure to ultraviolet light, a photosensitizer, and a ultraviolet screening agent in water containing a water-soluble high molecular weight compound to form a dispersion of colloidal particles, and

exposing the dispersion to ultraviolet light to cause said colloidal particles to cure only at their surface, thereby forming micro-capsules having a core of the uncured acrylate or methacrylate monomer or oligomer encapsulated with a wall layer of the cured acrylate or methacrylate.

10. A micro-capsule consisting essentially of

a fluid core encapsulated with a solid wall layer, said core and said wall having an identical composition consisting essentially of an acrylate or methacrylate monomer or oligomer, a polymerization accelerator or initiator, an ultraviolet screening agent and an additive selected from the group consisting of o-sulfobenzimides and amines, said composition constituting an adhesive, and said wall layer being a cured product.

4,588,640

PARTICULATE COMPOSITIONS

William J. Matlach, St. Louis, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Filed Jul. 10, 1984, Ser. No. 628,709
Int. Cl.[4] B23B *25/14, 27/08, 27/32;* C08K *9/00*
U.S. Cl. 428—407 6 Claims

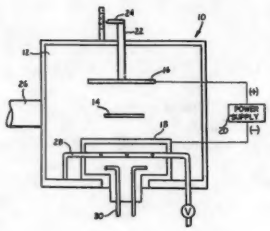
1. In a solid, particulate composition of matter comprising a solid mixture of a chemical additive for petroleum systems said additive being a low molecular weight polymer or mixture or polymers containing side chains of at least 12 carbon atoms and an essentially hydrocarbon soluble polymer compatible therewith said mixture having a melting point of above about 50° C. to about 150° C., the improvement which comprises an encapsulating coating on said solid mixture of a high melting point, essentially hydrocarbon insoluble polymer compatible with said mixture.

4,588,641

THREE-STEP PLASMA TREATMENT OF COPPER FOILS TO ENHANCE THEIR LAMINATE ADHESION

Reza Haque, Hamden, and Edward F. Smith, III, Madison, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Division of Ser. No. 554,466, Nov. 22, 1983, Pat. No. 4,524,089.
This application Mar. 4, 1985, Ser. No. 707,929
Int. Cl.[4] B05D *3/06, 5/10*
U.S. Cl. 428—413 10 Claims



1. A composite article comprising:
a copper or copper alloy foil having a plasma deposited polymeric film on at least one surface; and
a layer of plastic material bonded to said at least one foil surface on which said polymeric film is deposited.

2. The article of claim 1 further comprising said plastic material layer being formed from a fiberglass epoxy material.

4,588,642

THERMOPLASTIC FLUORINE-CONTAINING RESIN LAMINATE

Masahide Ochiumi, Yokkaichi, Japan, assignor to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Filed May 9, 1984, Ser. No. 608,472
Claims priority, application Japan, May 20, 1983, 58-88964; Aug. 24, 1983, 58-154283
Int. Cl.[4] B32B *27/08*
U.S. Cl. 428—421 10 Claims

1. A laminate comprising a layer of the following modified resin(a) or (b) and a layer of a thermoplastic fluorine-containing resin, wherein:
(a) is a resinous modified copolymer comprising an ethylene-vinyl acetate copolymer having vinyl acetate graft-copolymerized onto at least a part of the copolymer in an amount of at least 5 percent by weight based on the modified copolymer, wherein the total vinyl acetate content is 20 to 80 percent by weight based on the weight of the modified copolymer;
(b) is a resinous modified copolymer comprising a copolymer selected from the group consisting of ethylene-lower alkyl acrylate copolymer, ethylene-lower alkyl methacrylate copolymer and the combination thereof, said copolymer having lower alkyl acrylate, lower alkyl methacrylate or a combination thereof graft-copolymerized onto at least a part of said copolymer in an amount of at least 5 percent by weight based on the weight of the modified copolymer, wherein the total lower alkyl acrylate and lower alkyl methacrylate content is 20 to 80 percent by weight based on the weight of the modified copolymer.

4,588,643

PERFLUOROCARBON POLYMERIC COATINGS HAVING LOW CRITICAL SURFACE TENSIONS

Donald L. Schmidt, Midland, Mich.; Louis W. Meyer, Lake Jackson, Tex., and Demetrius Urchick, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 18, 1983, Ser. No. 476,661
Int. Cl.[4] B32B *27/00;* B05D *7/22*
U.S. Cl. 428—422 2 Claims

1. An internal surface of a coated molding apparatus wherein the adherent coating of the surface results from contacting (1) a linear or branched polymer containing a proportion of ionic functional moieties and (2) a proportion of a perfluorocarbon compound having a $—CF_3$ group and a counterionic character, said polymer and said perfluorocarbon compound being present in amounts such that the composition has a critical surface tension of wetting of less than about 15 dynes/cm, in a volatile acidic or basic solution, applying the resulting solution to the surface, and allowing the volatile acidic or basic solution to evaporate.

4,588,644

Patent Not Issued For This Number

4,588,645

RUBBER ARTICLES HAVING AN IMPROVED APPEARANCE

Masaki Ogawa, and Yasuro Shiomura, both of Kodaira, Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Feb. 27, 1985, Ser. No. 706,415
Claims priority, application Japan, Feb. 28, 1984, 59-35172
Int. Cl.[4] B32B *9/04*
U.S. Cl. 428—447 6 Claims

1. A rubber article having at its surface a coating of an organopolysiloxane, whose friction coefficient being 1.2 to 3.0 times that of a non-branched polydimethylsiloxane having a volatile loss of 0.1% when heating at 150° C. for 2 hours and a viscosity at 25° C. of 5,000 cst; said friction coefficient being measured by placing a steel column having a bottom area of 20 cm^2 and a weight of 100 g on a sample of 0.5 μm in thickness arranged on a polished steel plate and applying a force to the column in a direction parallel with the steel plate and expressed as a value of dividing a force required in the beginning of the column movement by 100 g.

4,588,646

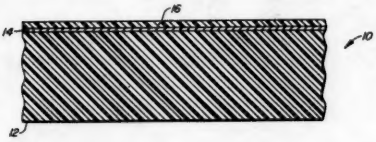
PROTECTIVE SHEET FOR ARTICLES OF CLOTHING AND THE LIKE

Robert D. Athey, Jr., 741 Ashbury Ave., El Cerrito, Calif. 94530

Filed Oct. 15, 1984, Ser. No. 660,746
Int. Cl.[4] B32B *15/04, 15/06, 15/08*
U.S. Cl. 428—457 15 Claims

1. A protective sheet for use as an article of clothing comprising:
a. a first layer of soft pliant material having a low initial tensile modulus of elasticity;
b. a second layer held to said first layer, and second layer comprising a ductile material capable of forming positive ions and being impermeable to fluids, said second layer being thinner than said first layer, said first and second layers forming opposite first and second surfaces of the

protective sheet respectively, said first surface of said protective sheet intended for serving as the inner most layer of the article of clothing; and



c. a third layer held onto said second layer comprising a flexible oxygen impermeable, scratch resistant material.

2. The protective sheet of claim 1 in which said material of said second layer is a metal.

4,588,647

PERPENDICULAR MAGNETIZATION FILM AND THE PREPARATION THEREOF

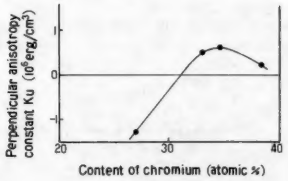
Yoshifumi Sakurai, Mino; Takuhisa Numata, Hirakata; Kazuo Saito, Takarazuka, and Koji Saiki, Toyonaka, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Sep. 26, 1985, Ser. No. 780,515

Claims priority, application Japan, Sep. 27, 1984, 58-202196

Int. Cl.[4] H01F *10/02*

U.S. Cl. 428—457 **4 Claims**



1. A perpendicular magnetization film comprising a magnetic thin film of iron-chromium alloy and a substrate; said magnetic thin film being supported on the substrate and having an easy magnetization axis perpendicular to the plane of substrate, and said alloy containing 20 to 60 atomic % of chromium.

4,588,648

MULTIPLE LAYER PLASTIC FILM HAVING POLYPROPYLENE ADHERED TO NYLON

Duane A. Krueger, Neenah, and Thomas W. Odorzynski, Green Bay, both of Wis., assignors to American Can Company, Greenwich, Conn.

Division of Ser. No. 417,674, Sep. 13, 1982, Pat. No. 4,552,714, and a continuation-in-part of Ser. No. 236,601, Feb. 20, 1981, Pat. No. 4,361,628. This application Jul. 30, 1984, Ser. No. 635,630

Int. Cl.[4] B32B *27/08*

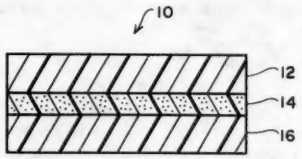
U.S. Cl. 428—475.8 **7 Claims**

1. A multiple layer plastic film, comprising:

(a) a layer of polypropylene;

(b) a layer of nylon; and

(c) a functionally adhesive layer juxtaposed between said nylon layer and said polypropylene layer, said adhesive layer being a blend consisting essentially of (i) a graft copolymer of maleic anhydride onto an olefin polymer or copolymer and (ii) an upgrafted propylene-based polymer; and adhesive blending containing from about 0.005% to 0.75% maleic anhydride based on the total weight of the entire blend composition.



4,588,649

AQUEOUS DIELECTRIC COATINGS BASED ON COPOLYMERS OF HIGH ACID CONTENT

Karel Kriz, Mount Prospect, and Ralph L Minnis, Des Plaines, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Dec. 20, 1984, Ser. No. 684,101

Int. Cl.[4] C08K *3/26*

U.S. Cl. 428—511 **11 Claims**

1. Conductive paper coated with a dielectric coating composition comprising, a pigmented aqueous dispersion of a carboxyl-functional copolymer of copolymerized monoethylenically unsaturated monomers including from 8% to 18% by weight of monoethylenically unsaturated carboxylic acid, based on the total weight of monoethylenic monomer, this carboxyl-functional copolymer being dispersed in water with the aid of a volatile amine, and the water dispersion being pigmented to contain calcium carbonate and/or clay in a pigment to binder weight ratio of from 0.5:1 to 6:1, said coating composition being applied to said conductive paper in an amount of at least about 4 pounds per ream.

4,588,650

OLEFIN POLYMER STRETCH/CLING FILM

Bernard S. Mientus, Newark; William G. Fields, Heath, and Marlin G. Bussey, Thornville, all of Ohio, assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 427,231, Sep. 29, 1982. This application Dec. 31, 1984, Ser. No. 687,689

Int. Cl.[4] C08L *23/18;* **B32B** *27/32, 27/18*

U.S. Cl. 428—516 **10 Claims**

1. A stretch/cling film which is biaxially oriented and rapidly quenched following the extrusion thereof comprising:

(a) a first polymer layer, having a thickness at least about 50 percent of the total stretch/cling film thickness, the polymer layer consisting essentially of

(i) an ethylenic copolymer having, in polymerized form, a major proportion of ethylene and a minor proportion of a higher α-olefin monomer containing 6 or more carbon atoms, a melt index of from about 1 to about 10 decigrams/minute, a density of from about 0.915 to about 0.930 grams/cubic centimeter and no significant quantity of a tackifying agent;

(b) at least one surface layer, the surface layer consisting essentially of:

(i) an ethylenic copolymer having, in polymerized form, a major proportion of ethylene and a minor proportion of a higher α-olefin monomer containing 6 or more carbon atoms, a melt index of from about 1 to about 10 decigrams/minute, a density of from about 0.915 to about 0.930 grams/cubic centimeter, and

(ii) from about 1.5 to about 10 weight percent of a tackifying agent, based on the surface layer weight, the tackifying agent selected from the group of tackifying agents consisting of:

(1) terpene resins,

(2) isotactic and atactic polypropylenes, and

(3) polybutenes;

(c) an Elmendorf tear rating in the machine direction of at least about 250 grams/mil;

(d) a machine direction: transverse direction Elmendorf tear ratio of at least 0.5; and

(e) a cling value of at least about 10 grams per 5 inches of sample width.

4,588,651

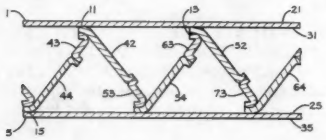
ACCORDION EXPANSION PROCESS

Leonardo Israeli, Los Angeles, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 16, 1983, Ser. No. 466,987

Int. Cl.[4] E04B *2/28*

U.S. Cl. 428—594 **19 Claims**



1. A method of forming sandwich structures from a plurality of workpieces by accordion expansion, comprising:

providing two outer workpieces, each of said outer workpieces having two opposed principal surfaces;

providing at least two core workpieces, each of said core workpieces having two opposed principal surfaces;

positioning said workpieces in a stack contacting at their principal surfaces, such that said outer workpieces sandwich said core workpieces and at least one core workpiece is superimposed over another core workpiece;

joining at selective areas said core workpieces to each other and to said outer workpieces, said joined areas on opposite outer workpieces being out of vertical alignment; and

expanding said joined stack by pressure means into a die, such that said core workpieces unfold and form an inclined web relative to said outer workpieces, with said joined core workpieces being substantially in linear alignment, and such that no one of said core workpieces contacts both of said outer workpieces.

4,588,652

WELDED CONSTRUCTION AND COMPONENTS THEREFOR

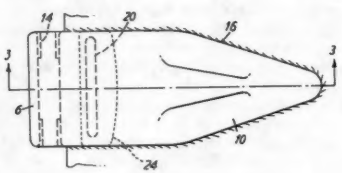
Kenneth Reynard, Thirsk, England, assignor to George Blair PLC, Newcastle Upon Tyne, England

Filed Jul. 6, 1984, Ser. No. 628,324

Claims priority, application United Kingdom, Jul. 8, 1983, 8318589

Int. Cl.[4] B32B *15/00*

U.S. Cl. 428—594 **11 Claims**



1. A welded structure comprising a supporting surface, a member secured to said surface, an interface between said member and said surface, a seam weld joining the member and the surface extending partially around said interface along a periphery thereof, there being at least one interruption in the seam weld along the extend of said periphery, a recess being provided in at least one of the member and the supporting surface in the region of said interruption for receiving an insert before the member is secured to said surface while permitting direct contact between the member and the surface, said insert being of a material that is stable at normal temperatures but that has flowed at an elevated temperature, whereby a seal is provided by said material between the member and the surface along said at least one interruption of the peripheral seam weld.

4,588,653

MAGNETIC MEMORY DISK

Daniel X. Wray, Canoga Park, Calif., assignor to Dynamic Disk, Inc., Carlsbad, Calif.

Continuation-in-part of Ser. No. 527,349, Aug. 29, 1983, Pat. No. 4,469,566. This application Jun. 11, 1984, Ser. No. 619,475

Int. Cl.[4] G11B *5/66, 5/82*

U.S. Cl. 428—600 **8 Claims**

1. A magnetic memory disk, comprising:

a disk-shaped substrate;

an electroplated base layer over a surface of the disk; and

an electroplated magnetic layer formed on the base layer, said magnetic layer comprising an alloy of at least two metals varying in relative concentrations in the alloy in a controlled fashion radially along the disk and providing a controlled varying value of coercivity in the radial direction of the disk.

4,588,654

MAGNETIC RECORDING MEDIUM

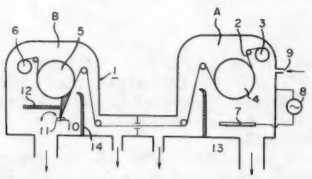
Takayoshi Kobuke; Toshiaki Izumi; Seitoku Saito, and Kazumasa Fukuda, all of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed May 27, 1982, Ser. No. 382,775

Claims priority, application Japan, Jun. 3, 1981, 56-84423

Int. Cl.[4] H01F *10/02*

U.S. Cl. 428—626 **2 Claims**



1. A magnetic recording medium comprising a high molecular-weight polyester resin substrate having thereon, in succession, a sub-layer of aluminum or Co/Ni metal formed by a sputtering method, and a thin magnetic layer formed by a vapor deposition method, thereby imparting a surface hardness to said magnetic recording medium which is substantially greater than that of a magnetic recording medium in which the sub-layer and thin magnetic layer are both formed by a vapor deposition method.

4,588,655

CERAMIC FLAME SPRAY POWDER

Burton A. Kushner, Old Bethpage, N.Y., assignor to Eutectic Corporation, Flushing, N.Y.

Division of Ser. No. 388,263, Jun. 14, 1982, abandoned. This application May 7, 1984, Ser. No. 608,267
Int. Cl.[4] C03C *27/02;* B05D *1/10*
U.S. Cl. 428—633 21 Claims

1. A method of coating a metal substrate with an adherent layer of a ceramic composition which comprises,

flame spraying an alloy bond coat on said substrate,

and then flame spraying over said bond coat a ceramic composition consisting essentially by weight of about 10 to 50% alumina and the balance essentially zirconia, said composition being in the form of particles selected from the group consisting of spray dried particles, agglomerated resin-bonded particles and fused particles,

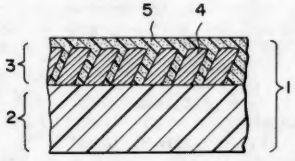
whereby a bonded ceramic coating is produced characterized by improved resistance to spalling at thicknesses ranging up to about 0.1 inch and higher and further characterized by being stronger and tougher than flame sprayed coatings of stabilized zirconia alone.

4,588,656

METHOD OF PREPARING A MAGNETIC RECORDING MEDIUM

Tatsuji Kitamoto; Ryuji Shirahata; Yasuyuki Yamada, and Goro Akashi, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Feb. 25, 1982, Ser. No. 352,462
Claims priority, application Japan, Feb. 27, 1981, 56-28195
Int. Cl.[4] H01F *10/02*
U.S. Cl. 428—694 14 Claims



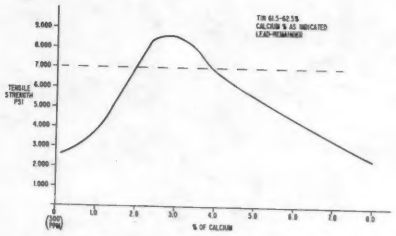
1. A method of preparing a magnetic recording medium which comprises vapor-depositing a thin ferromagnetic metal film having spaced-apart columnar grain structures onto a substrate, impregnating the spaces between the columnar grain structures with at least one organic monomer or oligomer in the liquid form, and polymerizing said at least one monomer or oligomer at least in the spaces between the columnar grain structures, whereby the resulting polymer is integrated with said thin ferromagnetic metal film.

4,588,657

SOLDER COMPOSITION

Erich F. Kujas, Philadelphia, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Nov. 1, 1984, Ser. No. 667,159
Int. Cl.[4] B32B *15/01;* C22C *13/00*
U.S. Cl. 428—641 7 Claims



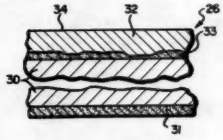
1. A solder composition consisting essentially of from about 55 to about 65 percent by weight of tin, from about 2 to about 3.9 percent by weight of calcium with the remainder of the composition being lead.

4,588,658

DIFFERENTIALLY COATED GALVANIZED STEEL STRIP

Ram S. Patil, Munster; Donald F. Johnson, Hammond, and John T. Quasney, East Chicago, all of Ind., assignors to Inland Steel Company, Chicago, Ill.

Division of Ser. No. 572,386, Jan. 20, 1984, Pat. No. 4,513,033. This application Nov. 16, 1984, Ser. No. 672,079
Int. Cl.[4] B32B *15/18;* C23C *1/02*
U.S. Cl. 428—659 7 Claims



1. A differentially coated, galvanized steel strip having a pair of opposite sides and comprising:

a steel substrate;

one of said strip sides having a relatively light coat composed of iron-zinc alloy throughout;

the other strip side having a relatively heavy coat, at least the outer part of said heavy coat consisting essentially of zinc;

iron-zinc alloy between said zinc outer part of the heavy coat and said steel substrate;

said other strip side having an outer surface;

there being no intermittent iron-zinc alloy bleed-throughs at the outer surface of said other strip side;

the light coat on said one strip side having a coating weight in the range 0.05–0.15 oz./ft.^{2} (0.015–0.045 kg/m^2);

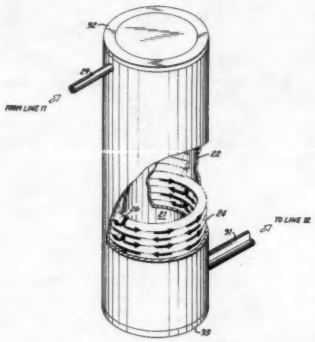
the heavy coat on said other strip side having a coating weight substantially less than 0.50 oz./ft.^{2} (0.15 kg./m^2).

4,588,659

FUEL VAPORIZER

Sandors G. Abens, Rye, N.Y., and William Keil, Redding, Conn., assignors to Energy Research Corporation, Danbury, Conn.

Filed Dec. 11, 1984, Ser. No. 680,309
Int. Cl.[4] H01M *8/18*; C10J *3/00*
U.S. Cl. 429—20 **11 Claims**



1. A vaporizer for converting liquid fuel to fuel vapor comprising:

a first wall surrounded by a second wall defining therebetween an annular chamber;

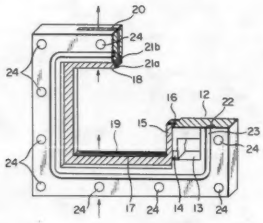
a plurality of rings situated in the chamber after the other along the chamber length, each ring extending over the circumference of the chamber in contact with said first and second walls, whereby said rings and walls define flow spaces for passage of fluid through said vaporizer, each ring having a passageway for enabling communication of the flow spaces on opposite sides of the ring.

4,588,660

FUEL CELL

Toshio Shimizu, Katsuta; Takanori Satoo, Hitachi; Ryota Doi, Ibaraki; Motoo Yamaguchi, Hitachi; Tsutomu Tsukui, Hitachi, and Yoshio Yoshioka, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 22, 1985, Ser. No. 714,921
Claims priority, application Japan, Mar. 23, 1984, 59-55703
Int. Cl.[4] H01M *8/02, 8/24*
U.S. Cl. 429—35 **9 Claims**



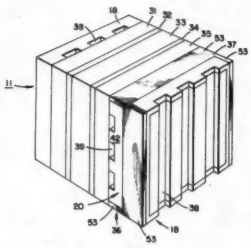
1. A fuel cell comprising a cell frame in which there are formed a fuel feed path and a product evacuation path passing through said frame in the thickness direction, said frame having a formation of annular offset sections at the inner edge sections on both sides with a cell element and a separator being fitted to said offset sections, said separator being formed by a conductive material and provided with grooves and ridges on both sides thereof and the top surfaces of said ridges of one side thereof being electrically connected to said cell element, said frame being provided with inner packings between the outer edges of said cell element and separator and the inner faces of said annular offset sections, said frame being further provided with an outer packing which runs continuously along one side of said frame at a position at least nearer to the outer edge of said frame than positions of said fuel feed path and products evacuation path, said cell element being positioned at one side of the annular offset section through said packing and said separator being positioned at the other side of the annular offset section through said packing.

4,588,661

FABRICATION OF GAS IMPERVIOUS EDGE SEAL FOR A BIPOLAR GAS DISTRIBUTION ASSEMBLY FOR USE IN A FUEL CELL

Arthur Kaufman, West Orange, and John Werth, Princeton, both of N.J., assignors to Engelhard Corporation, Menlo Park, N.J.

Filed Aug. 27, 1984, Ser. No. 644,831
Int. Cl.[4] H01M *4/88, 8/24*
U.S. Cl. 429—36 **19 Claims**



1. A process for the preparation of a bipolar gas reactant distribution assembly having solid, gas impervious edge seals to prevent leakage of gaseous reactants, which comprises

providing a pair of porous plate members provided with peripheral slits, the slits being generally parallel to, and spaced from each of two edges of the plate,

filling the slits with a non-porous, fusible gas impervious edge sealing compound,

assembling the plate members with the slits therein approximately perpendicular to one another and a layer of fusible sealing material interposed therebetween,

hot pressing the assembly at a temperature sufficient to cause a redistribution of the sealant layer into the pores of the adjacent plate surfaces and the edge sealing compound to flow and impregnate the region of the plates adjacent the slits and comingle with the redistributed sealant material to form a continuous layer of sealant along the edges of the assembly.

4,588,662

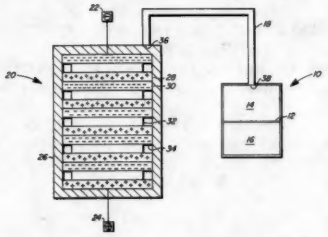
METHOD AND DEVICE FOR FILLING THE CELLS OF A BATTERY WITH ELECTROLYTE

George E. McManis, III; Aaron N. Fletcher, and Dan E. Bliss, all of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 29, 1985, Ser. No. 759,991
Int. Cl.[4] H01M *2/36, 6/36*
U.S. Cl. 429—52 **7 Claims**

7. A method of filling the cells of a battery with an electrolyte contained in a remote reservoir having partitioned dual chambers comprising application of heat to said reservoir, the reservoir and the battery being interconnected by a conduit

having a frangible seal therein such that transference of electrolyte is occasioned by the heat induced contraction of said



reservoir, rupturing of said seal under fluid pressure and flow of electrolyte from said reservoir into the battery cells.

4,588,663

LEVEL-ACID BATTERY HAVING AN IMPROVED TERMINAL PILLAR TO BATTERY LID SEAL

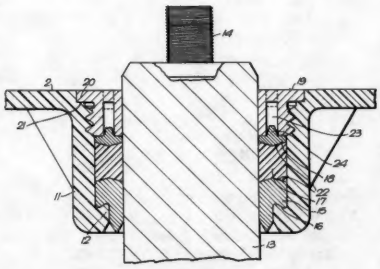
Anthony J. Mason, Market Harborough; Geoffrey J. May, Lutterworth, and Michael Turner, Market Harborough, all of United Kingdom, assignors to Tungstone Batteries Limited, Leicestershire, England

Filed Sep. 24, 1984, Ser. No. 653,703

Claims priority, application United Kingdom, Sep. 28, 1983, 8325949

Int. Cl.⁴ H01M *2/30*

U.S. Cl. 429—54 **8 Claims**



1. A sealed gas recombining lead acid electric battery comprising

(a) a battery casing,

(b) a battery lid sealed to said battery casing,

(c) at least one cell compartment within the battery casing having battery plates, plate separator means and electrolyte,

(d) terminal posts of opposite polarity electrically connected to the said battery plates and projecting through said battery lid to provide external electric connection to the battery and

(e) sealing means to provide a seal between each terminal post and the battery lid, said sealing means comprising

(1) a cylindrical trough having an axis, in which trough the terminal post is located, the trough being integrally formed in the lid and having a flange at its lower end, the flange surrounding the terminal post and having a surface inclined to the trough axis,

(2) a compressible sealing member the terminal post within the trough and located above said flange,

(3) a screw-threaded region on an upper part of the trough,

(4) an annular pillar centralising member disposed within the trough and surrounding the pillar to centralise the pillar within the trough, said pillar centralising member being located between said sealing member and said inclined flange formed on a side wall of the trough so as to support said centralising member, the centralising member having a surface adapted to conform to said inclined surface of the flange,

(5) an annular washer located within the trough and surrounding said pillar, said washer being located on top of said sealing member, and,

(6) an externally screw-threaded clamping member surrounding the terminal post in the said upper part of the trough in screw-threaded engagement with the trough, said clamping member being arranged to bear against said annular washer so that rotation of the clamping member to compress the sealing member causes the sealing member to be compressed axially and thereby extend radially and bear tightly against the terminal post and the trough forming an effective seal between the post and the lid.

4,588,664

PHOTOPOLYMERIZABLE COMPOSITIONS USED IN HOLOGRAMS

Herbert L. Fielding, Wilmington, and Richard T. Ingwall, Newton, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 526,156, Aug. 24, 1983, abandoned. This application Aug. 20, 1984, Ser. No. 641,993

Int. Cl.⁴ G03C *1/70, 9/08;* G03G *1/04*

U.S. Cl. 430—1 **37 Claims**

1. A photopolymerizable composition comprising an ethylenic unsaturated monomer, a dye sensitizer, and a branched polyethylenimine, said dye sensitizer and said branched polyethylenimine providing a photopolymerization initiation system.

22. The method of forming a photopolymer image which comprises imagewise exposing a photopolymerizable composition comprising an ethylenic unsaturated monomer, a dye sensitizer and a branched polyethylenimine to light absorbed by said dye sensitizer, said dye sensitizer and said branched polyethylenimine providing a photopolymerization system, thereby effecting imagewise photopolymerization of said monomer.

26. The method of claim **22** wherein said ethylenic unsaturated monomer is a monovalent salt of acrylic acid.

27. The method of claim **26** wherein said ethylenic unsaturated monomer is lithium acrylate.

28. The method of claim **27** wherein said photopolymerizable composition includes poly-N-vinyl pyrrolidone.

4,588,665

MICROGRAPHIC FILM MEMBER WITH LASER WRITTEN DATA

Jerome Drexler, Los Altos Hills, Calif., assignor to Drexler Technology Corporation, Mountain View, Calif.

Continuation-in-part of Ser. No. 443,596, Nov. 22, 1982, Pat. No. 4,503,135, which is a continuation-in-part of Ser. No. 238,832, Feb. 27, 1981, Pat. No. 4,360,728, and a continuation-in-part of Ser. No. 238,833, Feb. 27, 1981, abandoned. This application Jan. 22, 1985, Ser. No. 693,855

The portion of the term of this patent subsequent to Mar. 5, 2002, has been disclaimed.

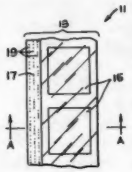
Int. Cl.⁴ G03C *3/00, 5/14*

U.S. Cl. 430—12 **10 Claims**

1. A micrographic film member comprising,

a micrographic image having borders surrounding the image, and

a strip of reflective-read direct-read-after-write laser recording material disposed in a border, said strip having laser



written indicia thereon, said indicia related to the micrographic image.

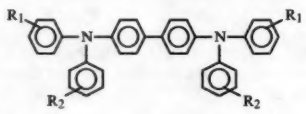
4,588,666

PHOTOCONDUCTIVE IMAGING MEMBERS WITH ALKOXY AMINE CHARGE TRANSPORT MOLECULES

Milan Stolka, Fairport; Kathleen M. McGrane, Rochester, and John S. Facci, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 24, 1985, Ser. No. 748,079
Int. Cl.[4] G03G *5/14*
U.S. Cl. 430—59 **24 Claims**

1. A hole transporting molecule for photoresponsive imaging members comprised of alkoxy derivatives of tetraphenyl biphenyl diamines of the following formula:



wherein R_1 is independently selected from the group consisting of hydrogen, ortho alkoxy, meta alkoxy, para alkoxy, ortho alkyl, meta alkyl, para alkyl, 3,5-dialkoxy, 2,4-dialkoxy, and 2,5-dialkoxy; and R_2 is selected from the group consisting of ortho alkoxy, meta alkoxy, para alkoxy, 3,5-dialkoxy, 2,4-dialkoxy, and 2,5-dialkoxy.

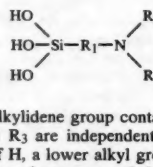
4,588,667

ELECTROPHOTOGRAPHIC IMAGING MEMBER AND PROCESS COMPRISING SPUTTERING TITANIUM ON SUBSTRATE

Robert N. Jones, Fairport, and Robert E. Heeks, Penfield, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 15, 1984, Ser. No. 610,552
Int. Cl.[4] C23C *14/34*; G03G *15/06, 5/00, 5/04*
U.S. Cl. 430—73 **16 Claims**

1. A process for the preparation of an electrophotographic imaging number comprising providing a substrate in a vacuum zone, sputtering titanium on said substrate in the absence of oxygen to deposit a titanium metal layer, applying a blocking layer comprising a siloxane, said siloxane comprising a reaction product of a hydrolyzed silane having the structural formula



wherein R_1 is an alkylidene group containing 1 to 20 carbon atoms and R_2 and R_3 are independently selected from the group consisting of H, a lower alkyl group containing 1 to 3 carbon atoms, a phenyl group, a poly(ethylene)amino group and an ethylene diamine group, applying a charge generating binder layer and applying a charge transport layer comprising a resin binder and a diamine compound.

4,588,668

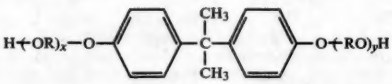
POLYESTER RESIN, ELECTROPHOTOGRAPHIC DEVELOPER COMPOSITION

Shinichiro Yasuda; Eiji Morimoto, and Yuichi Ueda, all of Wakayama, Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Jun. 4, 1984, Ser. No. 616,981
Claims priority, application Japan, Jun. 10, 1983, 58-103617; Jun. 10, 1983, 58-103618
Int. Cl.[4] G03G *9/08*
U.S. Cl. 430—109 **4 Claims**

1. An electrophotographic developer composition which comprises a binder resin and a colorant, said binder resin comprising a polyester resin having a softening point of 80° to 180° C., said polyester resin having been obtained by copolycondensing:

(A) a diol component of the formula:



(I)

wherein R represents an ethylene or propylene group and x and y represent each an integer of at least 1, the average number of x+y being 2 to 7,

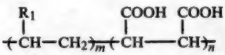
with

(B) carboxylic acid components comprising:

(a) a dicarboxylic acid, an anhydride thereof or a lower alkyl ester thereof,

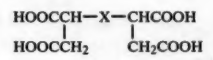
(b) trimellitic acid, an anhydride thereof or a lower alkyl ester thereof and

(c) a polycarboxylic acid having one of the following formulae, an anhydride or a lower alkyl ester thereof,



(II)

wherein R_1 represents an alkyl or alkenyl group having 20 to 60 carbon atoms, n+m is a number of 10 to 30 and the ratio of n to m is 1:4 to 4:1, the number-average molecular weight being 8,000 to 20,000



(III)

wherein X represents an alkylene or alkenylene group having 5 to 30 carbon atoms and at least one side chain having at least 3 carbon atoms.

4,588,669

PHOTOSENSITIVE LITHOGRAPHIC PLATE WITH DIAZO RESIN UNDERLAYER AND POLYVINYL ACETAL RESIN WITH AZIDE IN SIDE CHAIN OVERLAYER

Takateru Asano, Sakura, Japan, assignor to Fuji Chemicals Industrial Co., Ltd., Tokyo, Japan

Filed May 9, 1984, Ser. No. 608,457
Claims priority, application Japan, May 12, 1983, 58-83305
Int. Cl.[4] G03C *1/60, 1/71*; G03F *7/08*
U.S. Cl. 430—156 **8 Claims**

1. A photosensitive lithographic plate, comprising:

(a) a hydrophilic substrate;

(b) a photosensitive diazo resin layer superposed on said substrate, said photosensitive diazo resin being obtained

by the condensation of a salt of a diazo compound selected from the group consisting of 4-diazo-diphenylamine, 3-methoxy-4-diazo-diphenylamine, and 2,5-diethoxy-4-diazo-(tolylmercapto)-benzene with a condensing agent such as paraformaldehyde or 4,4'-bis-(methoxymethyl)-diphenyl ether; and

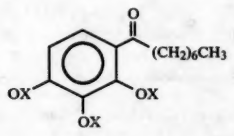
(c) a layer of photosensitive polyvinyl acetal resin having an acid number of 10 to 100 and containing an aromatic azide group in a side chain thereof, said layer of photosensitive polyvinyl acetal resin being superposed on said photosensitive diazo resin layer, said photosensitive polyvinyl acetal resin being produced by acetalizing a polyvinyl alcohol having a polymerization degree of 300 to 3000 with an azidoaryl aldehyde selected from the group consisting of p-azidobenzaldehyde, p-azidocinnamicaldehyde, and 1-azide-5-formyl naphthalene and subsequently esterifying the resultant acetal with at least one acid anhydride selected from the group consisting of succinic anhydride, maleic anhydride, phthalic anhydride, and trimellitic anhydride.

4,588,670
LIGHT-SENSITIVE TRISESTER OF O-QUINONE DIAZIDE CONTAINING COMPOSITION FOR THE PREPARATION OF A POSITIVE-ACTING PHOTORESIST

Michael Kelly, Coventry, R.I.; Donald C. Mammato, Lebanon; Dana Durham, Bloomsbury, both of N.J.; Sangya Jain, Hillsborough, N.J., and Lawrence Crane, Tustin, Calif., assignors to American Hoechst Corporation, Somerville, N.J.

Filed Feb. 28, 1985, Ser. No. 706,817
Int. Cl.[4] G03C *1/54, 1/60, 1/76*
U.S. Cl. 430—165 **17 Claims**

1. A light sensitive composition comprising a mixture of an alkali soluble resin and a light sensitive component, said light sensitive component consisting essentially of a compound of the formula



wherein X is a naphthoquinone-(1,2)-diazide-(2)-sulfonyl residue wherein the ratio by weight of said resin to said light-sensitive component is in the range of from about 1:1 to about 10:1.

4,588,671
PHOTO AND ELECTRON RESIST WITH DONOR-ACCEPTOR COMPLEX AND LIGHT SENSITIVE COMPOUND

Sergei P. Molodnyakov; Jury I. Fedorov; Vitaly A. Kuznetsov; Alexei N. Egorochkin; Tamara G. Birjukova, and Grigory A. Razuvaev, all of Gorky, U.S.S.R., assignors to Institut Khimii Akademii Nauk SSSR, U.S.S.R.

PCT No. PCT/SU81/00078, § 371 Date Aug. 1, 1983, § 102(e) Date Aug. 1, 1983, PCT Pub. No. WO83/02339, PCT Pub. Date Jul. 7, 1983
PCT Filed Dec. 21, 1981, Ser. No. 522,173
Int. Cl.[4] G03C *1/60;* **G03F** *7/26*
U.S. Cl. 430—191 **5 Claims**

1. A film-forming photo-and electron-resist composition, comprising a resist formed from

a light-sensitive compound selected from the group consisting of o-benzoquinone diazide, p-benzoquinone diazide, and o-naphthoquinone diazide, and

a film-forming compound, said resist being present in an amount sufficient to react with actinic light,

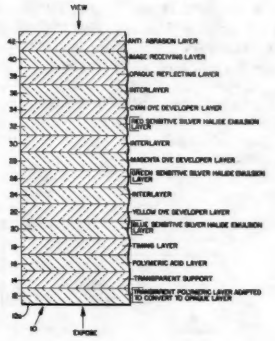
iodine as an additive which with said resist forms a donor-acceptor complex, said additive being present in an amount sufficient to react with said resist to form said complex and to thereby eliminate luminescence effect and to increase the resist stability, and

an organic solvent in an amount sufficient to dissolve said resist and said additive.

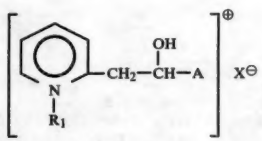
4,588,672
PHOTOGRAPHIC SYSTEM WITH QUATERNARY RELEASER

John M. Dolphin, East Boston, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Aug. 8, 1985, Ser. No. 763,817
Int. Cl.[4] G03C *1/40, 5/54, 1/06*
U.S. Cl. 430—218 **14 Claims**



9. A diffusion transfer photographic element comprising a transparent support carrying a photosensitive system comprising a silver halide emulsion layer in association with an image dye-providing material layer and an image receiving layer, said photosensitive system including a compound represented by the formula



wherein R_1 is $-(CH_2)_n-R_2$; R_2 is hydrogen alkyl or aryl; A is an aromatic group; X is an anion; and n is an integer of from 1 to 6.

4,588,673
RETOUCHABLE MAT FILM

Shinzi Kataoka; Yukio Shinagawa, and Shinji Sakaguchi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 509,078, Jun. 29, 1983, abandoned. This application Feb. 22, 1985, Ser. No. 704,903
Claims priority, application Japan, Jun. 30, 1982, 57-114358
Int. Cl.[4] G03C *1/06, 1/76*
U.S. Cl. 430—264 **5 Claims**

1. A wash-off photographic material, comprising:

a hydrophobic support having formed thereon:

a mat layer comprising:

a silicon dioxide matting agent; and

a binder comprised of a mixture of poly(methyl methacrylate) or a copolymer containing at least 80 wt % of methyl methacrylate and a hydrophilic polymer wherein the

mixture includes the hydrophilic polymer in an amount within the range of 80 to 20 wt % based on the total weight of the binder; and wherein the ratio of the matting agent to the polymethyl methacrylate or copolymer containing at least 80 wt % of methyl methacrylate is less than 5:1 or less by weight; and

a photosensitive silver halide emulsion layer.

2. A wash-off photographic material as claimed in claim 1, wherein the photosensitive silver halide emulsion layer contains a tanning developing agent.

4,588,674

LASER IMAGING MATERIALS COMPRISING CARBON BLACK IN OVERLAYER

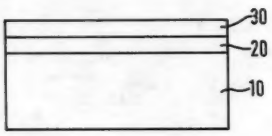
Malcolm J. Stewart, 14 Ashley Pl., Ramsbury, Marlborough, Wiltshire; Andrew Hudson, The Fish House, Cokethorpe, Witney, Oxfordshire, and Peter W. Griffiths, 1 Grove Road, Wantage, Oxfordshire, all of England

Filed Oct. 13, 1983, Ser. No. 541,734

Claims priority, application United Kingdom, Oct. 14, 1982, 8229456

Int. Cl.[4] G03C *1/72*; G03F *7/26*; G01D *9/00*

U.S. Cl. 430—273 **14 Claims**



1. A laser imaging material comprising a thermally-stable transparent support, a first overlying layer which is transparent and is instantaneously thermally-chemically-decomposable with the production of a gas and is carried on a surface of the support, and a second overlying layer which comprises a material that is instantaneously thermally-chemically-decomposable with the production of a gas and that is pigmented with carbon black and which extends over and is adhered to the first overlying layer.

4,588,675

METHOD FOR FINE PATTERN FORMATION ON A PHOTORESIST

Hisashi Nakane, Kawasaki; Akira Yokota, Yamato; Mitsuo Yabuta, Samukawa, and Wataru Ishii, Hadano, all of Japan, assignors to Tok Yo Ohka Kogyo Co., Ltd., Kawasaki, Japan

Filed Nov. 19, 1984, Ser. No. 672,764

Claims priority, application Japan, Nov. 28, 1983, 58-221984

Int. Cl.[4] G03F *7/26*

U.S. Cl. 430—325 **2 Claims**

1. A method for finely patterning a photoresist layer on a substrate which comprises the steps of:

(a) forming a layer of a negative-type photoresist composition comprising polymer and azide compound on a surface of a substrate;

(b) irradiatinig the photoresist layer in a pattern with actinic rays;

(c) heating the photoresist layer after exposure to the actinic rays at a temperature in the range from 200° to 500° C. by applying heat to the surface of the substrate plate which is not coated with the photoresist layer; and

(d) exposing the photoresist layer to an atmosphere of a plasma gas after heating the photoresist so as to decompose and remove the photoresist composition in the areas not irradiated with the actinic rays.

4,588,676

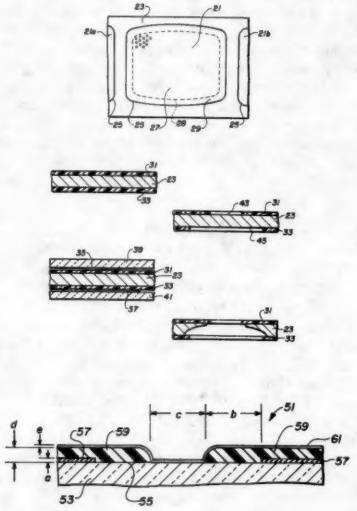
PHOTOEXPOSING A PHOTORESIST-COATED SHEET IN A VACUUM PRINTING FRAME

John J. Moscony; Thomas J. Michielutti, both of Lancaster, and Charles M. Wetzel, Lititz, all of Pa., assignors to RCA Corporation, Princeton, N.J.

Filed Jun. 24, 1983, Ser. No. 507,547

Int. Cl.[4] G03C *5/00*; G03F *7/26, 9/00*

U.S. Cl. 430—327 **5 Claims**



1. A method for exposing a coating of photoresist on a sheet, said method including positioning the coated sheet in a vacuum printing frame, said frame including a photographic printing plate comprising an opaque master pattern on one major surface of a transparent support, said pattern being positioned opposite said coating, evacuating said frame to a low pressure whereby said pattern and said coating are pressed towards one another, exposing said coating to actinic radiation through said pattern, and then devacuating said frame, said opaque pattern consisting essentially of a layer having a substantially uniform thickness in the range of about 0.5 ± 0.2 micrometer, and said printing plate carries a coating of islands of light-transmitting rubbery material over opaque portions of said master pattern, said islands being separated from each other in the non-opaque portions of said master pattern to provide continuous paths therebetween for shortening times for said evacuating and devacuating steps.

4,588,677

METHOD FOR PROCESSING SILVER HALIDE COLOR PHOTOSENSITIVE MATERIALS

Takatoshi Ishikawa, and Junya Nakajima, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

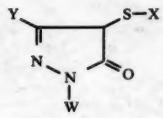
Filed Dec. 28, 1984, Ser. No. 687,044

Claims priority, application Japan, Dec. 29, 1983, 58-248470

Int. Cl.[4] G03C *7/16*

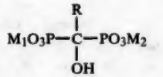
U.S. Cl. 430—387 **7 Claims**

1. A method for processing a silver halide color photosensitive material which comprises processing a silver halide color photosensitive material containing at least one 4-mercapto-5-pyrazolone type magenta coupler represented by formula (I)



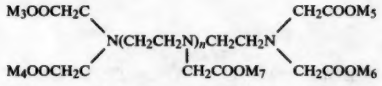
(I)

wherein W represents an aryl group; X represents an alkyl group, an aryl group or a heterocyclic ring group; and Y represents an acylamino group, a ureido group, or an anilino group; with a color developer containing at least one compound selected from a compound represented by formula (II)



(II)

wherein R represents a lower alkyl group; and M_1 and M_2, which can be the same or different, each represents a hydrogen atom, an alkali metal atom, or an ammonium group; a compound represented by formula (III)



(III)

wherein M_3, M_4, M_5, M_6 and M_7, which can be the same or different, each represents a hydrogen atom, an alkali metal atom, or an ammonium group, and n represents an integer of 1 or 2; an aminopolyphosphonic acid, and a phosphonocarboxylic acid in a concentration greater than 5.0×10^{-3} mol/liter.

4,588,678

SILVER HALIDE PHOTOGRAPHIC MATERIAL AND DEVELOPMENT METHOD

Hideo Ikeda, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 4, 1984, Ser. No. 657,694

Claims priority, application Japan, Oct. 4, 1983, 58-185305

Int. Cl.[4] G03C *5/30*

U.S. Cl. 430—420 **15 Claims**

1. A development method for a silver halide photographic material, wherein an imagewise exposed silver halide photographic material comprising a support having thereon at least a silver halide emulsion layer containing silver halide grains having a silver iodide content higher than 1.5 mole%, and having a silver iodide distribution in the silver halide grains that is homogeneous throughout the grains or a silver iodide content present in the central portion of the grains from above 50% to 95% and a silver iodide content present in the surface portion of the grains from 5% to less than 50%, is processed using a processing liquid containing a dialdehyde series hardening agent, whereby fog is reduced.

4,588,679

COLOR PHOTOGRAPHIC SILVER HALIDE LIGHT-SENSITIVE MATERIAL

Nobuo Furutachi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 9, 1984, Ser. No. 569,136

Claims priority, application Japan, Jan. 7, 1983, 58-937

Int. Cl.[4] G03C *7/26*

U.S. Cl. 430—551 **6 Claims**

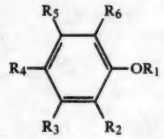
1. A color photographic silver halide light-sensitive material exhibiting improved light fastness, comprising:

a support base having thereon:

a silver halide emulsion layer;

a 1H-pyrazolo[3,3-C]-s-triazole coupler; and

a compound represented by the formula (I):



(I)

wherein R_1 is a hydrogen atom, an alkyl group, an aryl group, a silyl group, or a heterocyclic group; R_2, R_3, R_5 and R_6 are each a hydrogen atom, a hydroxyl group, an alkyl group, an aryl group, an alkoxyl group or an acylamino group; R_4 is an alkyl group, a hydroxyl group, an aryl group, a silyloxy group or an alkoxyl group; R_1 and R_2 may combine together to form a 5- or 5-membered ring, provided that R_4 is a hydroxyl group or an alkoxyl group, or R_1 and R_2 may combine together to form a methylenedioxy ring; and R_3 and R_4 may combine together to form a 5-membered hydrocarbon ring, provided that R_1 is an alkyl group, an aryl group, or a heterocyclic group.

4,588,680

ASSAY FOR VIRUSES

Doris J. Bucher, New York; Mohamed W. Khan, Flushing, both of N.Y., and Igor G. Kharitonenkov, Moscow, U.S.S.R., assignors to Mount Sinai School of Medicine of the City University of New York, New York, N.Y.

PCT No. PCT/US81/01033, § 371 Date Mar. 31, 1983, § 102(e) Date Mar. 31, 1983, PCT Pub. No. WO83/00505, PCT Pub. Date Feb. 17, 1983

PCT Filed Jul. 31, 1981, Ser. No. 500,550

Int. Cl.[4] C12Q *1/70;* **G01N** *53/00, 33/545;* **C12N** *9/96*

U.S. Cl. 435—5 **4 Claims**

1. A method for detecting viruses having M-protein in virion, comprising the steps of:

(a) incubating the sample suspected to contain said virus at a temperature of about 20° C. to about 100° C. for at least 1 minute in the presence of an assay surface which preferentially adsorbs M-proteins or viral fragments having exposed M-protein and an incubation medium effective to disrupt viral particles and release M-protein or viral fragments containing exposed M-protein, whereby said M-protein or viral fragments are adsorbed on said surface;

(b) incubating the surface having M-protein adsorbed thereon with an M antibody which is specific for the M-protein of the virus to be assayed in an incubation medium which suppresses non-specific adherence of the antibody; and

(c) thereafter detecting the extent to which the M antibody has been immunoadsorbed by proteins adhering to said surface.

4,588,681

PROCESS FOR PRODUCING ADULT T CELL LEUKEMIA ASSOCIATED ANTIGEN

Takashi Sawada, Yatabemachi; Tomiaki Morimoto, Hino; Isao Miyoshi; Hirokuni Taguchi, both of Kouchi; Junichi Tohmatsu, Tsuchiura, and Toyohiro Kitamura, Matsudo, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Filed Sep. 23, 1983, Ser. No. 535,457

Claims priority, application Japan, Sep. 30, 1982, 57-169670

Int. Cl.[4] C12Q *1/70;* **G01N** *33/53, 33/554;* **B65D** *71/00*

U.S. Cl. 435—5 **29 Claims**

1. A process for producing an antigen associated with adult T cell leukemia which comprises treating adult T cell leukemia associated antigen producing cells with a surfactant capable of separating said antigen from said cells and selected from group

consisting of sodium deoxycholate, octylphenoxypolyethoxyethanol and polyoxyethylene (10) octylphenyl ether, and then recovering said antigen.

4,588,682

BINDING NUCLEIC ACID TO A SUPPORT

Suzanne Groet, Sudbury; Jonathan Ostman, Boston, and Robert Wydro, Framingham, all of Mass., assignors to Integrated Genetics, Inc., Framingham, Mass.

Filed Dec. 13, 1982, Ser. No. 448,979
Int. Cl.[4] G01N *33/50*; C12Q *1/68*
U.S. Cl. 435—6 **18 Claims**

1. A method of binding nucleic acid to a nucleic acid-binding support comprising depositing without fixing, said nucleic acid onto said support following denaturation of said nucleic acid, and then contacting said nucleic acid and said support with a liquid binding solution which is compatible with said support and which contains an organic solvent which is capable of binding said DNA to said support, for a period of time sufficient to effect said binding.

4,588,683

METHOD OF PREPARING 11β, 17α, 20, 21-TETRAHYDROXY STEROIDS AND CORRESPONDING 11β, 17α, 21-TRIHYDROXY-20-OXO STEROIDS

Charles T. Goodhue; Gwendolyn C. Kydd, both of Rochester, N.Y.; Charles H. Foster, and Charles A. McCombs, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 6, 1984, Ser. No. 577,467
Int. Cl.[4] C12P *33/08*; C12R *1/645*
U.S. Cl. 435—59 **15 Claims**

1. A method for preparing an 11β, 17α, 20α or β, 21-tetrahydroxy steroid, said method comprising incubating a 17α, 20α or β, 21-trihydroxy steroid of the pregnane class in the presence of a culture medium capable of effecting 11β-hydroxylation of said trihydroxy steroid, said medium comprising a fungal culture of the genus Curvularia or enzymes produced therefrom.

4,588,684

A-FACTOR AND ITS PROCESSING SIGNALS

Anthony J. Brake, Berkeley, Calif., assignor to Chiron Corporation, Emeryville, Calif.

Filed Apr. 26, 1983, Ser. No. 488,857
Int. Cl.[4] C12P *21/00*; C12N *15/00, 1/16, 1/00*
U.S. Cl. 435—68 **11 Claims**

1. A DNA construct comprising the yeast leader sequence of a-factor including processing signals and a heterologous gene in reading frame with said leader sequence and processing signals.

4,588,685

PROCESS FOR THE PREPARATION OF A NEW-TYPE ACTIVE SUBSTANCE SELECTIVELY INHIBITING FOOD INTAKE

József Knoll, Budapest; Janós Nagy, Szentendre; Huba Kalasz, and Berta Knoll, both of Budapest, all of Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

Filed Jul. 19, 1984, Ser. No. 632,439
Claims priority, application Hungary, Jul. 29, 1983, 2718/83
Int. Cl.[4] C12P *21/06*
U.S. Cl. 435—69 **9 Claims**

1. A process for isolating a food intake suppressant from human or animal blood serum which comprises subjecting the human and/or animal blood serum to ultrafiltration on a membrane or hollow fiber ultrafilter passing a filtrate containing substances of a molecular weight of at most 50,000 daltons, partially evaporating the filtrate, removing the insoluble part from the concentrate obtained, adding trichloroacetic acid up to a concentration of 5 to 25 weight/volume percent to the liquid phase at a temperature of 0° C. to 10° C., removing the proteins precipitated, subjecting the obtained solution to chromatography on a gel with an elution solution of pH 6.0 to 7.0, concentrating the biologically active fractions, chromatographing again on a gel with a void volume having a molecular weight of 3000 to 4000 daltons, fractionating by elution with water, lyophilizing the active fractions, dissolving the lyophilized fractions in a buffer of pH 8.1 to 8.2, adding trypsin and chymotrypsin to the solution in substantially identical amounts of 0.01 to 0.2 by weight as calculated for the total weight of the lyophilized product, subjecting the mixture to digestion at a temperature of 36° C. to 39° C. for 20 to 30 hours, adding after the first 5 hours an equal quantity of trypsin and chymotrypsin in a substantially half amount as calculated for the original enzyme quantity and continuing the digestion, then adding trichloroacetic acid to the reaction mixture up to a concentration of 4 to 6 weight/vol. % at a temperature between 0° C. and 10° C., keeping the mixture at a temperature between −15° C. and 5° C. for 1 to 24 hours, removing the insoluble part, subjecting the reaction mixture to chromatography on a gel with a void volume having a molecular weight of 3000 to 4000 daltons, fractionating by elution with water and lyophilizing the biologically active fractions to yield said food intake suppressant having a molecular weight between 40,000 and 50,000 daltons.

4,588,686

ENZYMATIC PROCESS FOR PREPARING GLUCURONIDES

Walter C. Herlihy, Cambridge, and Thomas H. Fraser, Newtonville, both of Mass., assignors to Repligen Corporation, Cambridge, Mass.

Division of Ser. No. 381,528, May 24, 1982, Pat. No. 4,443,608. This application Jan. 31, 1984, Ser. No. 575,521
Int. Cl.[4] C12P *19/58*; C07P *41/00*
U.S. Cl. 435—77 **3 Claims**

1. An in vitro enzymatic process for preparing essentially pure ammonium (+),(−)-tropicamide Oβ-D-glucuronic acid which comprises:

(a) incubating liver microsomes at a temperature of about 20° to about 40° C. in the presence of a buffer to maintain the pH at about 7 to about 8.5, with
  (1) an aglycon, (+,−)-tropicamide, and
  (2) uridine 5'-diphosphoglucuronic acid, for a sufficient time to conjugate the aglycon with glucuronic acid, and
(b) isolating essentially pure ammonium (+),(−)-tropicamide O-β-D-glucuronic acid from the reaction mixture.

4,588,687

METHOD FOR PRODUCING L-TRYPTOPHAN BY FERMENTATION

Takayasu Tsuchida, Yokohama; Osamu Kurahashi; Hiroki Kawashima, both of Kawasaki; Shigeru Nakamori, Yokohama, and Hitoshi Enei, Zushi, all of Japan, assignors to Ajinomoto Company Incorporated, Tokyo, Japan

Filed Nov. 24, 1982, Ser. No. 444,151
Claims priority, application Japan, Nov. 24, 1981, 56-188089
Int. Cl.[4] C12P *13/22*; C12N *15/00, 1/20, 1/00*
U.S. Cl. 435—108 **2 Claims**

1. A method for producing L-tryptophan by fermentation which comprises:

(a) aerobically culturing an L-tryptophan-producing microorganism having the identifying characteristics of *Bacillus subtilis* AJ 11715 in an aqueous culture medium containing a carbon source and a nitrogen source in the absence of anthranilate and indole; and
(b) recovering the L-tryptophan accumulated in the culture medium.

4,588,688

PROCESS FOR THE PRODUCTION OF MUCONIC ACID

Peter C. Maxwell, New Providence, N.J., assignor to Celanese Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 287,344, Jul. 27, 1981, abandoned. This application Jul. 22, 1983, Ser. No. 516,231
The portion of the term of this patent subsequent to Oct. 19, 1999, has been disclaimed.
Int. Cl.[4] C12P *7/44;* C12N *15/00, 1/16;* C12R *1/40*
U.S. Cl. 435—142 1 Claim

1. A process for the production of muconic acid which comprises metabolizing catechol via the ortho pathway to muconic acid in a bioconversion medium, with a microorganism which possesses catechol 1,2-oxygenase with activity that is not inhibited in the presence of a low level up to about one gram or more of muconic acid per liter of bioconversion medium, which lacks active muconate lactonizing enzyme and active catechol 2,3-oxygenase, which is capable of metabolizing catechol quantitatively to an accumulated quantity of muconic acid greater than about one gram per liter of the bioconversion medium, and which has the identifying characteristics of *Pseudomonas putida* Biotype A strain ATCC No. 31916.

4,588,689

RESTRICTION ENDONUCLEASE XCYI

Clarence I. Kado; Raymond L. Rodriguez, both of Davis; Byron E. Froman, West Sacramento, and Robert C. Tait, Davis, all of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Mar. 2, 1984, Ser. No. 585,752
Int. Cl.[4] C12N *9/22, 15/00;* C12R *1/64*
U.S. Cl. 435—199 4 Claims

1. A restriction endonuclease having substantially the same amino acid sequence as XcyI derived from *Xanthamonas cyanopsidis* 13D5, which endonuclease recognizes the sequence:

5'-C ↓ CCGGG-3',

and cleaved where indicated by the arrow.

4,588,690

PREPARATION OF THE ENZYME β-GLUCANASE BY FERMENTATION OF FUNGI

Bernt A. Nissen, Stathelle, and Jon Hovland, Porsgrunn, both of Norway, assignors to Norsk Hydro a.s., N-Oslo, Norway

PCT No. PCT/NO83/00056, § 371 Date Aug. 15, 1984, § 102(e) Date Aug. 15, 1984, PCT Pub. No. WO84/02533, PCT Pub. Date Jul. 5, 1984
PCT Filed Dec. 5, 1983, Ser. No. 642,628
Claims priority, application Norway, Dec. 22, 1982, 824321
Int. Cl.[4] C12N *9/24;* C12R *1/785*
U.S. Cl. 435—200 13 Claims

1. A process for preparation of β-glucanase which comprises:

preparing an inoculum of a species of the fungus *Rhizomucor pusillus* (Lindt) Schipper;

introducing the inoculum and a nutrient medium for the fungus into a fermenter, said nutrient medium containing nutrient salts, trace materials and carbon and nitrogen sources;

fermenting the contents of the fermenter under submersible, aerobic, thermophilic conditions; and

isolating β-glucanase from the resultant contents of the fermenter.

4,588,691

METHOD FOR PREPARATION OF FRACTION I PROTEIN AND BY-PRODUCTS THEREOF

Sarjit S. Johal, 935 Canyon View Dr. #302, Sagamore Hills, Ohio 44067

Filed Feb. 29, 1984, Ser. No. 584,669
Int. Cl.[4] C12N *9/88;* A61K *35/78;* C08G *8/02*
U.S. Cl. 530—379 4 Claims

1. An improved method for preparing ribulose 1, 5-bisphosphate carboxylase (RuBisCO) from plant material, said method comprising:

(a) comminuting the plant material in an aqueous solution to form a suspension;

(b) fractionating the suspension to release the RuBisCO from the comminuted plant material into the suspension;

(c) adding a sufficient amount of polyethylene glycol (PEG) to the suspension so that crystals of RuBisCO are selectively formed;

(d) separating the crystals from the suspension, leaving a supernatant; wherein the improvement comprises:

(e) adjusting the pH of the supernatant to above 10 to cause precipitation of phosphorylated sugars;

(f) separating the phosphorylated sugars from the supernatant; and

(g) recycling the supernatant from step (f) to provide at least a portion of the PEG required in step (c) and repeating step (d) as often as is required to isolate substantially all of the RuBisCo crystals from the supernatant.

4,588,692

ANTIBIOTIC COMPOUNDS, PROCESS FOR THE PREPARATION AND PHARMACEUTICAL COMPOSITIONS THEREOF, METHODS OF TREATMENT THEREWITH AND STAPHYLOCOCCUS BACTERIA

William J. Cunliffe, 47 Tredgold Avenue, Bramhope, Nr. Leeds; Elizabeth A. Eady, 20 Woodlea Road, Leeds, and Keith T. Holland, 13 Hall Park Avenue, Hereforth, Leeds, all of United Kingdom

Division of Ser. No. 270,523, filed as PCT GB80/00164 on Oct. 13, 1980, published as WO81/00962 on Apr. 16, 1981, § 102(e) date Jun. 4, 1981. This application Mar. 2, 1984, Ser. No. 586,356
Claims priority, application United Kingdom, Oct. 12, 1979, 7935534
Int. Cl.[4] A61K *37/00;* C07G *7/00;* C12R *1/45;* C12N *1/20*
U.S. Cl. 435—253 1 Claim

1. A biologically pure culture of the microorganism *Staphlococcus epidermidis* having all of the identifying characteristics of NCIB 11536, and mutants thereof, said culture being capable of producing an antibiotic polypeptide compound having a molecular weight of from about 950 to 10,000 and possessing bactericidal and bacteriolytic properties with respect to Gram-positive bacteria, in a recoverable quantity upon fermentation in an aqueous nutrient medium containing assimilable sources of carbon, nitrogen and inorganic substances.

4,588,693

DEVELOPMENT OF PLANT ROOTS

Gary A. Strobel, Bozeman, Mont., assignor to Research and Development Institute, Inc. at Montana State University, Bozeman, Mont.

Filed Feb. 28, 1983, Ser. No. 470,392
Int. Cl.[4] C12N *1/20, 15/00;* A01B *79/00;* A01C *1/00*
U.S. Cl. 435—253 39 Claims

1. Biologically pure *Agrobacterium rhizogenes* ATCC 39207.

2. A composition for the genetic transformation of dicotyledonous plants for the beneficial growth of roots which comprises:

(a) root-inducing *A. rhizogenes* provided in a concentration sufficient to provide an aqueous suspension of cells in a

concentration sufficient to genetically transform the dicotyledonous plant to enhance root growth; and

(b) *A. radiobacter* in an amount sufficient to diminish the *A. rhizogenes* to substantially noninfective levels.

4,588,694

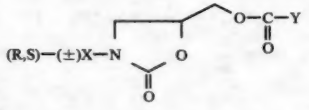
PROCESS FOR PRODUCTION OF OPTICALLY ACTIVE OXAZOLIDINONE DERIVATIVE

Shigeki Hamaguchi, Kobe; Hiroshi Yamamura, Takasago; Junzo Hasegawa, Akashi; Hajime Kawaharada, Kakogawa, and Kiyoshi Watanabe, Akashi, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Aug. 12, 1983, Ser. No. 522,687
Claims priority, application Japan, Aug. 13, 1982, 57-141575
Int. Cl.[4] C07B *19/02*
U.S. Cl. 435—280 **23 Claims**

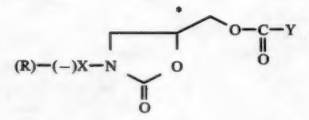
1. A process for producing an optically active (S)-(+)-3-alkyl-5-acyloxymethyloxazolidin-2-one which comprises subjecting a racemic compound (R,S)-(±)-3-alkyl-5-acyloxymethyloxazolidin-2-one having the formula:

[(R,S)—II]



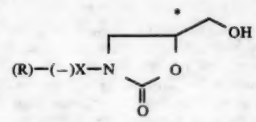
wherein X is a lower alkyl group and Y is a substituted or unsubstituted alkyl group, an alkenyl group, or a substituted or unsubstituted aromatic hydrocarbon group, to the action of a microorganism or an enzyme derived from said microorganism, said microorganism being selected from the group consisting of Enterobacter, Klebsiella, Micrococcus, Citrobacter, Escherichia, Pseudomonas, Staphylococcus, Alcaligenes, Achromobacter, Streptomyces, Candida, Debaryomyces, Endomyces, Hansenula, Geotrichum, Kluyveromyces, Metschnikowia and Pichia and having a stereoselective esterase activity capable of asymmetrically hydrolyzing the compound (R)-(−)-3-alkyl-5-acyloxymethyloxazolidin-2-one having the formula:

[(R)-II]



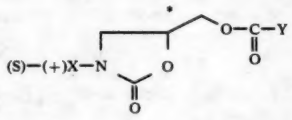
wherein X and Y are as heretofore defined to produce an optically active (R)-(−)-3-alkyl-5-hydroxymethyloxazolidin-2-one having the formula:

[(R)-I]



wherein X is as heretofore defined and isolating the unreacted optically active (S)-(+)-3-alkyl-5-acyloxymethyloxazoldin-2-one having the formula:

[(S)-II]



wherein X and Y are as heretofore defined from the produced optically active (R)-(−)-3-alkyl-5-hydroxymethyl-oxazolidin-2-one.

4,588,695

DETERMINATION OF UNSATURATED IRON-BINDING CAPACITY

Susumu Takano, Nagaokakyo, and Yoshikey Yoneda, Matsubara, both of Japan, assignors to Wako Pure Chemical Industries, Ltd., Osaka, Japan

Filed Sep. 25, 1984, Ser. No. 654,292
Claims priority, application Japan, Sep. 26, 1983, 58-177505
Int. Cl.[4] G01N *33/90*
U.S. Cl. 436—87 **9 Claims**

1. A process for measuring unsaturated iron-binding capacity in serum which comprises:

adding to serum a reagent mixture comprising iron ions in an amount in excess of the amount required to react with all unbound transferrin in the serum, a reducing agent for reducing Fe^{3+} ions to Fe^{2+} ions, and at least one acid component selected from the group consisting of hydroxy acids and salts of hydroxy acids, wherein the pH of said reagent mixture is 7.5 to 9.5, and the concentration of said acid component is 0.05 to 0.4 mole/liter,

adding to the resulting mixture a reagent which forms a color with the excess unreacted iron ions, and

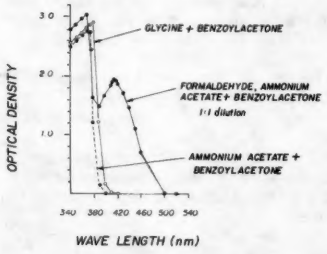
measuring the amount of unreacted iron ions colorimetrically.

4,588,696

PELLET PROCESS FOR THE DETECTION OF FORMALDEHYDE AND/OR GLUTARALDEHYDE

Cleamond D. Eskelson, 7402 Calle Toluca, Tucson, Ariz. 85710

Filed Feb. 17, 1983, Ser. No. 447,014
Int. Cl.[4] G01N *21/78*
U.S. Cl. 436—130 **19 Claims**



19. A method of testing for formaldehyde and/or glutaraldehyde comprising the steps of:

combining benzoylacetone or its derivatives and ammonium acetate, at a pH of about 4.5–6, with a test solution suspected to contain formaldehyde and/or glutaraldehyde to produce a yellow color if formaldehyde and/or glutaraldehyde are present; and

comparing the yellow color produced to a chart containing different yellow colors and formaldehyde and/or glutaraldehyde concentration levels corresponding to each of the different yellow colors on the chart.

4,588,697

METHOD FOR PERFORMING FLUORESCENT PROTEIN BINDING ASSAY EMPLOYING NOVEL ALKYL SUBSTITUTED FLUORESCENT COMPOUNDS AND CONJUGATES

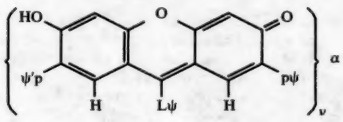
Pyare Khanna, Mountain View, and Edwin F. Ullman, Atherton, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Division of Ser. No. 399,506, Jul. 19, 1982, Pat. No. 4,481,136, which is a division of Ser. No. 73,158, Sep. 7, 1979, Pat. No. 4,351,760. This application Oct. 23, 1984, Ser. No. 664,121

Int. Cl.[4] G01N *33/543, 33/545, 33/549, 33/533*

U.S. Cl. 436—518 **5 Claims**

1. In a method for performing a fluorescent protein binding assay, which comprises combining in an assay medium a sample suspected of containing an analyte and members of a signal producing system wherein one of said members comprises a conjugate of a member of a specific binding pair either ligand or receptor and a spectroscopically active compound, and measuring the level of said signal in said assay medium, the improvement which comprises employing as said conjugate a compound of the formula



wherein:

α is a member of a specific binding pair either ligand or receptor covalently bonded to one of ψ or ψ';

ρ is an aliphatic hydrocarbon group of from about 1 to 12 carbon atoms.

ψ' is hydrogen or non-oxocarbonyl;

L is a bond or divalent radical;

ψ is a linking group bonded to α or a group terminating in a heteroatom containing functionality when not bonded to α; and

ν is a number between 1 and the molecular weight of α divided by 500.

4,588,698

ENCAPSULATED SCINTILLATORS FOR MEASURING THE CONCENTRATION OF TRITIATED SOLUTES

Sol M. Gruner, Lawrenceville, and Gregory Kirk, Princeton, both of N.J., assignors to University Patents, Inc., Westport, Conn.

Filed Oct. 19, 1982, Ser. No. 435,528

Int. Cl.[4] G01N *33/54, 33/56*

U.S. Cl. 436—535 **14 Claims**

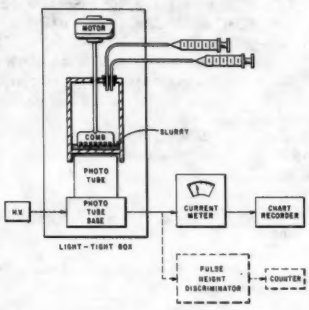
1. A composite material comprising a microencapsulated central solid scintillator core capable of releasing photons when exposed to a source of radiation, and a selective permeable coating about said core, said coating having a width at least as wide as the range of radioactivity of said radiation.

10. A radioimmunoassay technique for the determination of a substance in a fluid test medium which comprises:

(1) Providing a quantity of antibody directed towards the substance to be determined to a test fluid;

(2) providing a quantity of a beta labelled substance to said test fluid; and

(3) providing a quantity of composite material comprising a microencapsulated central solid scintillator core capable of releasing photons when exposed to a source of radiation, and a selective permeable coating about said core,



said coating having a width at least as wide as the range of radioactivity of said radiation and further having a pore size small enough to exclude antibody substance complex molecules but not antibody molecules to said incubating mixture; and

(4) determining the amount of photons released by the scintillator core in said composite material.

4,588,699

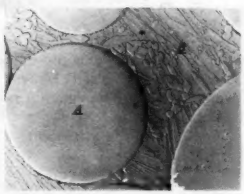
HIGH STRENGTH, THERMALLY STABLE MAGNESIUM ALUMINOSILICATE GLASS-CERAMIC MATRIX-SIC FIBER COMPOSITES

John J. Brennan, Portland, Conn.; Kenneth Chyung, and Mark P. Taylor, both of Painted Post, N.Y., assignors to United Technologies Corporation, Hartford, Conn.

Filed Mar. 17, 1983, Ser. No. 476,301

Int. Cl.[4] C03C *10/06, 10/08, 14/00;* **C04B** *35/56*

U.S. Cl. 501—9 **2 Claims**



5300 X

1. A silicon carbide fiber reinforced glass-ceramic composite consisting essentially of about 15% to about 70% by volume of silicon carbide fibers implanted within a glass-ceramic matrix consisting essentially of:

MgO—5–15%,

As_2O_3—0.5–3%,

Al_2O_3—20–40%,

Nb_2O_5—0–10%,

SiO_2—40–60%,

Ta_2O_5—0–10%,

BaO—5–15%,

and when fully crystallized is predominantly barium osumilite, the composite having high strength and thermal stability at temperatures in excess of 1200° C.

4,588,700
COATING TO PREVENT THE OXIDATION OF ELECTRODES DURING ELECTRIC FURNACE STEEL MAKING

Frederick V. Reven, Homewood, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Division of Ser. No. 404,099, Aug. 2, 1982, Pat. No. 4,487,804.
This application Jul. 2, 1984, Ser. No. 627,175
Int. Cl.[4] C03C *6/04;* **C05C** *8/24;* **C04B** *35/56, 35/46*
U.S. Cl. 501—31 **3 Claims**

1. A composition useful to provide a di-electric coating upon carbon and graphite electrodes used in the production of ferrous metals in electrical arc furnaces which consists essentially of in percentages by weight;

10–70% water;

0.5–15% finely divided silicon dioxide, having a particle size less than 200 mesh;

1–25% phosphoric acid;

2–50% titanium dioxide having a particle size of less than 375 mesh;

2–50% silicon carbide;

0.05–7.5% sodium hexameta phosphate; and

0.1–5.0% organic thickener.

4,588,701
CATALYTIC CRACKING CATALYSTS

Robert L. Chiang, Oakland, N.J.; Raymond G. Perigard, Ossining, and Jule A. Rabo, Armonk, both of N.Y., assignors to Union Carbide Corp., Danbury, Conn.

Filed Oct. 3, 1984, Ser. No. 657,413
Int. Cl.[4] B01J *29/06*
U.S. Cl. 502—65 **73 Claims**

1. A process for preparing a catalyst comprising the following steps:

(i) contacting a mixture of a large pore zeolite and an inorganic oxide matrix, with a fluoro salt of the formula

$$A_{(n-m)}[MF_n]_z \quad (1)$$

wherein "A" is an organic or inorganic ionic moiety; $[MF_n]_z$ is a fluoroanion moiety comprising the element "M"; "M" is an element selected from the group of elements from Groups VB, VIB, VIIB, VIII, IIIA, IVA and VA of the Periodic Table of Elements; "n" is the coordination number of "M"; "m" is the valence of "M"; and "z" is the valence or charge associated with "A"; at a pH greater than about 3, at effective conditions of temperature and time.

3. The process of claim **1** or **2** wherein the product is cation exchanged with a catalytically effective amount of at least one rare earth cation selected from the class consisting of cerium, lanthanum, praseodymium, neodymium, promethium, samarium, europium, gadolinium, terbium, lutetium, dysprosium, holmium, erbium, thulium and ytterbium.

4,588,702
HIGH PERFORMANCE CATALYSTS FOR CARBOMETALLIC OIL CONVERSION AND THEIR MANUFACTURE AND USE

H. Wayne Beck, Russell, Ky.; James D. Carruthers, Fairfield, Conn.; Edward B. Cornelius, Ashland, Ky.; Ronald A. Kmecak, Ashland, Ky.; Stephen M. Kovach, Ashland, Ky., and William P. Hettinger, Jr., Russell, Ky., assignors to Ashland Oil, Inc., Ashland, Ky.

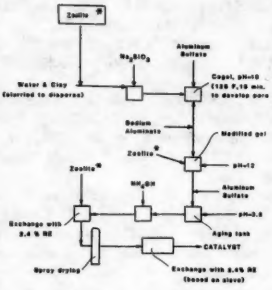
Division of Ser. No. 483,061, Apr. 7, 1983, Pat. No. 4,480,047.
This application Oct. 18, 1984, Ser. No. 662,475
The portion of the term of this patent subsequent to Oct. 30, 2001, has been disclaimed.
Int. Cl.[4] B01J *29/08*
U.S. Cl. 502—65 **24 Claims**

1. A low coke, high octane, high activity, high selectivity, metal tolerant, thermally stable, low slurry oil producing catalyst for the conversion of feed hydrocarbons containing normal paraffins and contaminated with carbon and metals to produce lower molecular weight products, said catalyst comprising in combination:

(a) from about 8 to about 25% by weight of a zeolite comprising HY zeolite, having a silica-alumina mole ratio of at least about 5, and having a cell dimension of about 24.30 to about 24.70 angstroms;

(b) from about 20 to about 70 wt% of a clay comprising kaolin, having a crystallite size of from about 0.5 to about 2 microns;

(c) from about 35 to about 70% of an acidic silica-alumina co-gel matrix comprising at least about 13 wt% alumina;



* Zeolite may be added at all or any point waterlines.

(d) from about 0.1 to about 3 wt% of rare earths comprising lanthanum and cerium in a ratio of from about 1 to about 6;

(e) from about 15 to about 60 wt% alumina;

(f) wherein said zeolite is partially exchanged with said rare earths from a solution and wherein said zeolite is contained in said acidic matrix and wherein a portion of said rare earths has been precipitated into said matrix; and

(g) a catalyst component incorporating a sufficient amount of ZSM-5 zeolite to crack at least a portion of normal paraffins present in the feed.

4,588,703
POLYOLEFIN POLYMERIZATION PROCESS AND CATALYST

Kiplin D. Cowan; Dale E. Pierce, and Oscar D. Nowlin, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 18, 1984, Ser. No. 632,082
Int. Cl.[4] C08F *4/62, 4/64, 4/68*
U.S. Cl. 502—111 **23 Claims**

8. A process for preparing a catalyst comprising (1) forming a first catalyst component by reacting reactants comprising (A) magnesium dichloride and (B) a transition metal compound selected from compounds of the formula $Ti(OR)_4$ wherein each R is individually selected from alkyl groups containing 1 to 70 carbon atoms; (2) reacting said first component with a precipitating agent comprising an organoaluminum halide; (3) reacting the solid from step (2) with a first portion of an activating component, and (4) reacting the solid from step (3) with at least one more portion of an activating component, wherein said activating component is free of electron donor and comprises $TiCl_4$.

9. A process according to claim **8** wherein said activating component comprises $TiCl_4$, $SiCl_4$ and $HSiCl_3$.

10. A process according to claim **9** wherein the molar ratio of $TiCl_4$ to $SiCl_4$ is the range of 3/1 to 4.5/1 and the molar ratio of $HSiCl_3$ to $SiCl_4$ is the range of 2.5/1 to 4/1.

11. A process according to claim **10** wherein said transition metal compound comprises titanium tetra-n-butoxide.

12. A process according to claim **11** wherein a benzoic acid

ester and a phenol are employed in the preparation of the first catalyst component.

4,588,704

RECOVERY OF INERT HYDROCARBON DILUENTS USED IN PREPARATION OF CATALYSTS

Charles A. Drake, and Bill Loffer, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 30, 1985, Ser. No. 728,909

Int. Cl.[4] C08F *4/62, 4/64, 4/68*

U.S. Cl. 502—111 **29 Claims**

1. In a process for preparation of a catalyst for the polymerization of olefins which comprises mixing a metal halide compound and a transition metal compound, allowing said thus mixed compounds to react to produce a reaction product and then contacting said reaction product with a precipitating agent to produce a solid reaction product and further contacting said solid reaction product with a transistion metal tetrahalide to produce a solid catalyst product, wherein all the above steps are conducted in a suitable organic diluent and wherein the solid catalyst product is washed at least once in a suitable organic diluent, the purification of effluent organic diluent by a process comprising the following steps:

(a) collecting separate portions of said organic diluents which have been respectively contacted with said precipitating agent and said transition metal tetrahalide,

(b) combining said separate portions of said organic diluent in a volume ratio range between 30:70 to about 70:30 with an amount of water equal to at least about 1.5 times the volume of said thus combined separate portions of said organic diluent to produce an acidic combined diluent mixture,

(c) separating the resulting organic and aqueous phases of said combined diluent mixture, and

(d) recovering treated organic diluent from said organic phase for further purification and recycling in said process for preparation of a catalyst.

4,588,705

METHOD FOR PREPARING DUAL COLLOID COMPOSITIONS

Thomas H. Vanderspurt, E. Amwell Twp., Hunterdon County, and Michael A. Richard, Fanwood, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Aug. 10, 1984, Ser. No. 639,443

Int. Cl.[4] B01J *21/04, 21/08, 23/46, 23/74*

U.S. Cl. 502—177 **16 Claims**

1. A method for preparing catalyst precursor compositions which upon activation results in a catalyst containing one of more reducible metallic phases and one or more non-reducible promoter phases which method comprises:

(a) forming a gel or suspension by admixing; (i) one or more transition metal cyano-containing anionic-complex solutions wherein at least on solution contains one or more reducible transition metals selected from the Groups IB, IIB, VIB, VIIB, VIII of the Periodic Table of the Elements, wherein the cations accompanying the anionic complexes may be one or more alkali metal ions, with (ii) one or more solutions containing metal cations wherein at least one of the metals is a nonreducible metal selected from the group consistion of Cr, Al, Th, U, Si, the lanthanides, and elements of Group IA, IIA, IIIB, IVB and VB of the Periodic Table of the Elements;

(b) heating the resulting gel, or suspension, at a temperature of about 90° C. to about 150° C. for an effective amount of time to allow hydrolysis and polymerization to occur;

(c) separating and drying the resulting solid precursor.

4,588,706

PHOSPHORUS CONTAINING HYDROFINING CATALYSTS

Simon G. Kukes, and Stephen L. Parrott, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 24, 1985, Ser. No. 748,112

Int. Cl.[4] B01J *27/19*

U.S. Cl. 502—211 **16 Claims**

1. A process for preparing a composition of matter comprising the steps of:

(A) mixing (a) at least one oxygen containing compound of a metal belonging to Group VIB of the Periodic Table, (b) at least one compound of a Group VIII metal selected from the group consisting of iron, cobalt and nickel, (c) phosphorous acid containing material, and (d) water, in such amounts and under such conditions as to obtain a solution;

(B) mixing the solution obtaining in step (A) with an alumina-containing support material;

(C) heating the mixture obtained in step (B) at a first temperature under such conditions as to at least partially dry said mixture; and

(D) heating the at least partially dried mixture obtained in step (C) in an inert, non-oxidizing and non-reducing atmosphere at a second temperature, which is higher than said first temperature, under such conditions as to activate said mixture.

4,588,707

CATALYST FOR THE REDUCTION OF THE IGNITION TEMPERATURE OF DIESEL SOOT FILTERED OUT OF THE EXHAUST GAS OF DIESEL ENGINES

Rainer Domesle, Maintal; Edgar Koberstein, Alzenau; Hans-Dieter Pietka, Freigericht, and Herbert Völker, Hanau, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Division of Ser. No. 521,292, Aug. 8, 1983, Pat. No. 4,515,758. This application Mar. 7, 1985, Ser. No. 709,261

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1982, 3232729

Int. Cl.[4] B01J *23/04, 23/22, 23/36, 23/72*

U.S. Cl. 502—225 **18 Claims**

1. A catalyst for treating exhaust of Diesel engines consisting essentially of

(a) a catalytically effective amount of at least one perrhenate of a metal and at least one substance selected from the group consisting of:

lithium oxide

copper (I)-chloride

vanadium pentoxide with 1 to 30% by weight of an alkali metal oxide, and

a vanadate of an alkali metal or cerium and

(b) deposited on an inert, thermally stable carrier therefor, or mixed with said carrier, and applied to a structural reinforcer which is alpha-alumina or cordierite; or

(c) applied to a structural reinforcer which is alpha-alumina or cordierite.

4,588,708

BIMETALLIC SOLVATED METAL ATOM DISPERSED CATALYSTS

Kenneth J. Klabunde, Manhattan, Kans., and Yuzo Imizu, Kitami, Japan, assignors to Kansas State University Research Foundation, Manhattan, Kans.

Filed Apr. 15, 1985, Ser. No. 723,216

Int. Cl.[4] B01J *23/24, 21/12*

U.S. Cl. 502—241 **10 Claims**

1. An activated bimetallic heterogeneous catalyst, comprising a catalyst support having deposited thereon a slovated dispersion of cobalt and manganese, said dispersion having been formed by co-condensation of cobalt, manganese, and

organic solvent vapors, said catalyst containing from 40 to 99 weight percent of atomically-dispersed cobalt together with from 60 to 1 percent of atomically-dispersed manganese based on the total weight of the cobalt and manganese.

3. The catalyst of claim 1 in which said atomic dispersion of cobalt and manganese was solvated with a solvent selected from the group consisting of toluene, xylene, and tetrahydrofuran.

5. The catalyst of claim 1 in which said catalyst support is selected from the group consisting of silica and alumina.

4,588,709

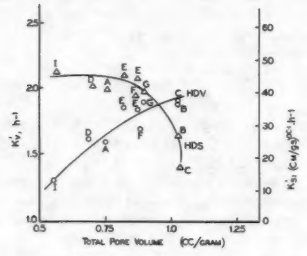
CATALYST FOR REMOVING SULFUR AND METAL CONTAMINANTS FROM HEAVY CRUDES AND RESIDUES

Alfredo L. Morales; Roberto Galiasso, both of San Antonio de Los Altos; Angel R. Carrasquel, and Jose A. Salazar, both of Los Teques, all of Venezuela, assignors to Intevep, S.A., Caracas, Venezuela

Continuation-in-part of Ser. No. 563,197, Dec. 19, 1983, Pat. No. 4,520,128. This application Apr. 19, 1985, Ser. No. 724,969

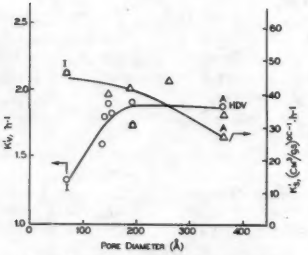
Int. Cl.[4] B01J *23/24*

U.S. Cl. 502—314 **14 Claims**



EXAMPLE 2: RELATION OF TOTAL CATALYST PORE VOLUME TO CONSTANTS K'_V AND K'_S

KEY: O=K'_V Δ=K'_S



EXAMPLE 2: RELATION OF AVERAGE CATALYST PORE DIAMETER TO CONSTANTS K'_V AND K'_S

KEY: O=K'_V Δ=K'_S

8. A catalyst for the simultaneous demetallization and desulfurization of heavy crudes and residues, comprising an alumina support material, said support being impregnated by a first impregnating compound; said impregnated support is subsequently impregnated by a second impregnating compound, said first impregnating compound consisting essentially of a metallic compound whose metallic component is selected from Group VIb of the Periodic Table, deposited on said support material so as to comprise from 5 to 30% of the catalyst by weight, calculated as oxide; said second impregnating consisting essentially of a metallic compound whose metallic component is selected from Group VIII of the Periodic Table, deposited on said support material so as to comprise from 0.1 to 8% of the catalyst by weight, calculated as oxide; said first and second impregnating compounds being reacted with a sulfur-containing reagent after deposition so as to produce catalytically active sulfides whereby a catalyst characterized by simultaneous demetallizing and desulfurizing activity wherein the ratio of percent of demetallizing to desulfurizing approaches unity over a useful life in excess of 80 days is obtained, said catalyst having the following physical properties: a total pore volume ranging from about between 0.8 to 0.9 ml/g, an average pore diameter of about between 200 to 300 Å and signal band strength ratios, as determined by X-ray photoelectron spectroscopy, as follows: I(Me VIb)/I(refractory metal) is between 5 and 8 and I(Me VIII)/I(refractory metal)is between 1 and 5.

4,588,710

MEDICAMENTS CONTAINING AMINO-CYCLITOL DERIVATIVES

Fred R. Heiker; Lutz Müller; Walter Puls, and Hilmar Bischoff, all of Wuppertal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 369,761, Apr. 19, 1982, Pat. No. 4,526,784. This application Jan. 16, 1985, Ser. No. 692,083

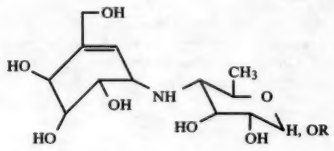
Claims priority, application Fed. Rep. of Germany, May 5, 1981, 3117705; Aug. 19, 1981, 3132691

The portion of the term of this patent subsequent to Jul. 2, 2002, has been disclaimed.

Int. Cl.[4] A61K *31/73*

U.S. Cl. 514—25 **5 Claims**

1. A pharmaceutical composition containing as an active ingredient an aminocyclitol derivative in crystalline form of the formula



in which

R denotes C_1–C_{30}-alkyl which is unsubstituted or substituted by 1 to 5 substituents selected from hydroxyl, C_1–C_4-alkoxy, amino, mono- or di-alkylamino having 1 to 4 carbon atoms per alkyl radical, mercapto, C_1–C_4-alkylthio, halogen, C_1–C_4-alkylcarbonyl, carboxyl, nitro, cyano, the aldehyde function and a sulphonic acid group or a C_2–C_6-alkenyl group having 1 to 3 double bonds and optionally carrying 1 to 5 substituents selected from hydroxy, C_2–C_4-alkoxy, mercapto, C_1–C_4-alkylthio, halogen and nitro, and in which the symbol "H, OR" indicates that both possible stereoisomeric formulae are included in amount effective for treating hyperlipaemia in admixture with an inert pharmaceutical carrier.

4,588,711

INSECTICIDAL PHOSPHORUS DERIVATIVES OF 6-CYCLOALKYL-4-PYRIMIDINOLS

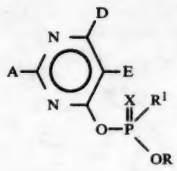
Walter Reifschneider, Walnut Creek; Doris L. Paroonagian, Pleasant Hill; Mark J. Costales, and Donald H. DeVries, both of Concord, all of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 443,420, Nov. 22, 1982, abandoned. This application Jun. 11, 1984, Ser. No. 619,513

Int. Cl.[4] A01N *57/08;* **C07F** *9/65*

U.S. Cl. 514—86 **30 Claims**

1. A compound corresponding to the formula



wherein

A represents hydrogen, alkyl, cycloalkyl, alkoxy, perfluoroloweralkyl, alkylthio, alkylsulfinyl, alkylsulfonyl, dialkylamino or phenyl;

D represents cyclopropyl, 1-methylcyclopropyl or cyclobutyl;

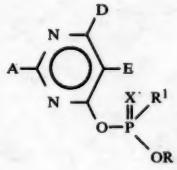
E represents hydrogen alkyl or halo;

X represents oxygen or sulfur;

R represents alkyl; and

R^1 represents alkyl, alkoxy, alkylthio, monoalkylamino or phenyl.

21. A method for the kill and control of insects which comprises contacting said insects or their habitat with a composition comprising an inert carrier in intimate admixture with an insecticidally effective amount of an active compound corresponding to the formula;



wherein

A represents hydrogen, alkyl, cycloalkyl, alkoxy, perfluoroloweralkyl, alkylthio, alkylsulfinyl, alkylsulfonyl, dialkylamino or phenyl;

D represents cyclopropyl, 1-methylcyclopropyl or cyclobutyl;

E represents hydrogen, alkyl or halo;

X represents oxygen or sulfur;

R represents alkyl; and

R^1 represents alkyl, alkoxy, alkylthio, monoalkylamino or phenyl.

4,588,712

(8S)-8-FLUOROERYTHROMYCIN DERIVATIVES, THE PROCESS FOR THE PREPARATION THEREOF AND THE PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Luciano Toscano, Naples, Italy, assignor to Pierrel S.p.A., Naples, Italy

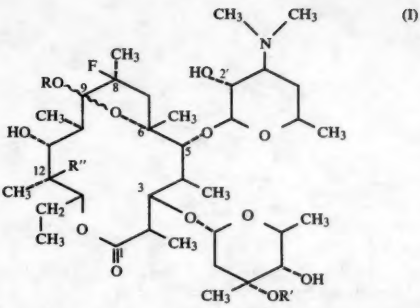
Filed Feb. 28, 1985, Ser. No. 706,496

Claims priority, application Italy, Mar. 8, 1984, 19950 A/84

Int. Cl.[4] A61K *31/71;* **C07H** *17/08*

U.S. Cl. 514—29 **10 Claims**

1. A compound of formula (I)



(I)

wherein R is an unsubstituted C_1–C_{10} alkyl or unsubstituted C_3–C_{10} alkenyl or R is C_1–C_{10} alkyl or C_3–C_{10} alkenyl substituted with a radical which a member selected the group consisting of lower alkoxy, cycloalkoxy, phenyl, substituted phenyl and substituted amino of formula

wherein R^3 and R^4, each independently, are lower alkyl or benzyl or R^3 and R^4 together with the adjacent nitrogen atom form a pyrrolidine, piperidine, piperazine or morpholine ring; or

R is phenyl or substituted phenyl;

R′ is hydrogen or methyl; and

R″ is hydrogen or hydroxy,

pharmaceutically acceptable esters, organic acid addition salts, and salt-esters thereof.

10. An antibiotic pharmaceutical composition for oral administration comprising a therapeutically effective amount of a compound of claim **1** and a pharmaceutical carrier therefor.

4,588,713

SELECTIVE BIOLOGICALLY ACTIVE 7-OXO-PROSTACYCLIN DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS CONTAINING SAME

Peter György; Geza Galambos, both of Budapest; Károly Kánay, Ocsa; József Ivanics, Budapest; György Dorman, Budapest; Gábor Kovács, Budapest; István Stadler, Budapest; Sandor Virág, Budapest; István Tömösközi, Budapest; Peter Körmöczky, Budapest, and Marianna Kovács, Budapest, all of Hungary, assignors to Chinoin Gyogyszer Vegyeszeti Termekek Gyara Rt., Budapest, Hungary

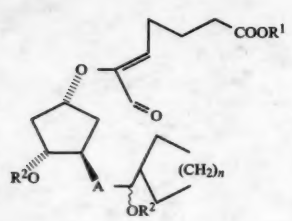
Filed Jan. 14, 1985, Ser. No. 691,340

Claims priority, application Hungary, Jan. 13, 1984, 128/84

Int. Cl.[4] A61K *31/557, 31/34;* **C07D** *307/935*

U.S. Cl. 514—63 **9 Claims**

1. A compound of the formula (I)



(I)

wherein

R^1 stands for hydrogen, C_{1-4} straight or branched alkyl or a pharmacologically acceptable cation,

R^2 stands for hydrogen, C_{1-4} alkanoyl, benzoyl, or benzoyl substituted by C_{1-4} alkyl or halogen, and R^2 can further represent tetrahydropyranyl, trialkylsilyl or alkoxyalkyl,

A stands for ethylene, cis or trans-vinylene or —C≡C—, and

n may represent 2, 3 or 4.

9. A method of inhibiting thrombocyte aggregation in an animal subject which comprises the step of administering to said animal subject a pharmaceutically effective amount of the compound of the formula (I) as defined in claim **1**.

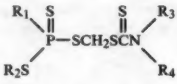
4,588,714

S-DITHIOCARBAMOYLMETHYL TRITHIOPHOSPHONATE INSECTICIDES, COMPOSITIONS AND USE

William G. Haag, Pleasant Hill, and Charles G. Chavdarian, Martinez, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

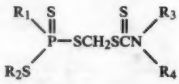
Filed Jan. 3, 1984, Ser. No. 567,489
Int. Cl.[4] **A01N** *57/20;* **C07F** *9/40*
U.S. Cl. 514—114 **24 Claims**

1. A compound having the formula



in which R_1 is an alkyl group having from 1 to 3 carbon atoms, R_2 is an alkyl group having from 3 to 6 carbon atoms, and R_3 and R_4 are independently alkyl groups having from 2 to 4 carbon atoms.

18. A method for controlling insects comprising applying to said insect or a locus at which control is desired an insecticidally effective amount of a compound having the formula



in which R_1 is an alkyl group having from 1 to 3 carbon atoms, R_2 is an alkyl group having from 3 to 6 carbon atoms, and R_3 and R_4 are independently alkyl groups having from 2 to 4 carbon atoms.

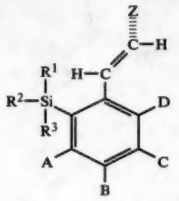
4,588,715

HEPTENOIC ACID DERIVATIVES

Robert E. Damon, II, Wharton, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Filed Jun. 4, 1984, Ser. No. 616,720
Int. Cl.[4] **C07F** *7/08;* **A61K** *31/695*
U.S. Cl. 514—63 **22 Claims**

1. A compound of the formula:



wherein each of R^1, R^2 and R^3 is independently, alkyl having from 1 to 4 carbon atoms; or phenyl which may be unsubstituted or substituted either by one or two alkyl or alkoxy groups having from 1 to 3 carbon atoms, or chloro; or by one fluoro, bromo or trifluoromethyl substituent;

A is a hydrogen atom or alkyl having from 1 to 3 carbon atoms,

B is a hydrogen atom; alkyl or alkoxy having from 1 to 4 carbon atoms; halo having an atomic weight of from about 19 to 80, trifluoromethyl; or phenyl, benzyl, or benzyloxy, wherein the aromatic portion may be unsubstituted, or substituted by up to two groups, one of which may be fluoro, bromo or trifluoromethyl; or one or two of which may be alkyl or alkoxy having from 1 to 4 carbon atoms, or chloro;

C is a hydrogen atom, alkyl or alkoxy having from 1 to 4 carbon atoms, halo having an atomic weight of from about 19 to 80, or trifluoromethyl; and

D is a hydrogen atom, alkyl or alkoxy having from 1 to 4 carbon atoms, halo having an atomic weight of from about 19 to 80 or trifluoromethyl;

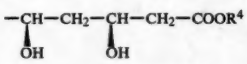
and any of A+B, B+C, or C+D may constitute a 4 carbon radical of the formula R°; which is either $R^{\circ 1}$:

—CH=CH—CH=CH—; or $R^{\circ 2}$:

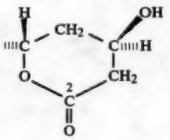
$-(CH_2)_4-$;

and that the ring formed by the radical R° may bear one halo having an atomic weight of from about 19 to 80, or alkyl or alkoxy substituent having from 1 to 4 carbon atoms; and

Z is a radical of the formula Z';



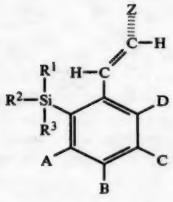
or a radical of the formula Z'':



wherein R^4 is hydrogen, C_{1-4}alkyl, and benzyl; or M;

wherein M is a cation forming a pharmaceutically acceptable salt with the provisions that there be no more than one trifluoromethyl group and no more than two bromos present on the molecule.

20. A composition useful for treating atherosclerosis in a mammal in need of such treatment, comprising an effective amount of a compound and an inert non-toxic, pharmaceutically acceptable carrier; the amount of compound, being an amount effective for inhibiting cholesterol biosynthesis in a mammal; said compound having the formula:



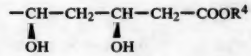
wherein each of R^1, R^2 and R^3 is independently, alkyl having from 1 to 4 carbon atoms; or phenyl which may be unsubstituted or substituted either by one or two alkyl or alkoxy groups having from 1 to 3 carbon atoms, or chloro; or by one fluoro, bromo or trifluoromethyl substituent;

A is a hydrogen atom or alkyl having from 1 to 3 carbon atoms, B is a hydrogen atom; alkyl or alkoxy having from 1 to 4 carbon atoms; halo having an atomic weight of from about 19 to 80, trifluoromethyl; or phenyl, benzyl, or benzyloxy, wherein the aromatic portion may be unsubstituted, or substituted by one or two groups, one of which may be fluoro, bromo or trifluoromethyl; or one or two of which may be alkyl or alkoxy having from 1 to 4 carbon atoms, or chloro;

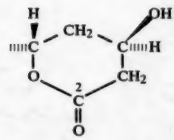
C is a hydrogen atom, alkyl or alkoxy having from 1 to 4 carbon atoms, halo having an atomic weight of from about 19 to 80, or trifluoromethyl; and

D is a hydrogen atom, alkyl or alkoxy having from 1 to 4 carbon atoms, halo having an atomic weight of from 19 to 80 or trifluoromethyl;

and any of A+B, B+C, or C+D may constitute a 4 carbon radical of the formula R°; which is either $R^{\circ 1}$: —CH=CH—CH=CH—; or $R^{\circ 2}$: —$(CH_2)_4$—; with the provisions that the ring formed by the radical R° may bear one halo having an atomic weight of from about 19 to 80, or alkyl or alkoxy substituent having from 1 to 4 carbon atoms; and Z is a radical of the formula Z':



a radical of the formula Z'':



wherein R^4 is hydrogen, C_{1-4}alkyl, or benzyl; or M;

wherein M is a cation forming a pharmaceutically acceptable salt:

with the provisions that there be no more than one trifluoromethyl group and no more than two bromos present on the molecule.

4,588,716

METHOD FOR TREATING METABOLIC BONE DISEASE IN MAMMALS

Hector F. DeLuca, and Heinrich K. Schnoes, both of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Continuation-in-part of Ser. No. 607,327, May 4, 1984, abandoned. This application Jan. 16, 1985, Ser. No. 691,824

Int. Cl.[4] A61K *31/595, 31/59, 31/56*

U.S. Cl. 514—168 **18 Claims**

1. A method for preventing or treating physiological disorders in mammals, which disorders are characterized by a requirement to regenerate or prevent loss of bone mass, which comprises administering to said mammals an amount of 1 alpha,25-dihydroxy-24-epi vitamin D_2 sufficient to induce mineralization of bone and thereby to increase or prevent loss of net bone mass.

4,588,717

COMPOUNDS AND VITAMIN SUPPLEMENTS AND METHODS FOR MAKING SAME

David C. Mitchell, Salt Lake City, Utah, assignor to David C. Mitchell Medical Research Institute, Salt Lake City, Utah

Filed Jun. 13, 1984, Ser. No. 620,131

Int. Cl.[4] A01N *45/00;* **A61K** *31/56*

U.S. Cl. 514—170 **40 Claims**

1. A vitamin supplement which comprises a fatty acid ester of a phytosterol, the fatty acid forming said ester having from about 18 to about 20 carbon atoms in the main carbon chain.

33. A method of achieving effective absorption of sitosterol and stigmasterol into a host, comprising the steps of:

condensing a first fatty acid with sitosterol to form an ester, the first fatty acid having from about 18 to about 20 carbon atoms in the main carbon chain;

condensing a second fatty acid with stigmasterol to form an ester, the second fatty acid having from about 18 to about 20 carbon atoms in the main carbon chain; and

administering the sitosterol ester and the stigmasterol ester to the host.

4,588,718

CARBOXY CONTAINING ESTER PRODRUGS OF CORTICOSTEROIDS

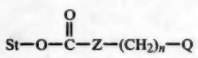
Bradley D. Anderson, Salt Lake City, Utah, and Robert A. Conradi, Portage, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Mar. 28, 1984, Ser. No. 594,098

Int. Cl.[4] C07J *5/00*

U.S. Cl. 514—172 **12 Claims**

1. A compound of the formula



wherein

St represents a corticosteroid moiety bonded to the carbonyl via the 21-hydroxy group of said corticosteroid;

wherein

Z is a bond or —O—;

wherein

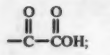
n is an integer from 4 to 9;

wherein

Q is

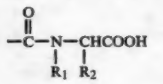
(1) Y—CH_2COOH wherein Y is —S—, —S(O)—, —S-(O_2)—, —SO_2N(R)—, or —N(R)SO_2; R is hydrogen or lower alkyl(C_1–C_4) with the proviso that the total carbon atoms in R and $(CH_2)_n$ is not greater than 10;

(2)



or

(3)



wherein

R_1 is hydrogen and R_2 is H, CH_3, CH_2COOH, CH_2CH_2COOH, CH_2OH, CH_2SH, $CH_2CH_2SCH_3$, or CH_2Ph—(OH) wherein Ph is phenyl and Ph—(OH) is p-hydroxyphenyl; or R_1 is CH_3 and R_2 is H; or R_1 and R_2 taken together are $—CH_2CH_2CH_2—$; or $N(R_1)CH(R_2)COOH$ taken together is $NHCH_2CONHCH_2COOH$; and pharmaceutically acceptable salts thereof.

9. A compound of claim 1 wherein the corticosteroid forming the St moiety is 6α-methylprednisolone, hydrocortisone, corticosterone, prednisone, prednisolone, triamcinolone, dexamethasone, betamethasone, flumethasone, 11-deoxycorticosterone, fluprednisolone, 9α-fluorohydrocortisone, paramethasone, chlorprednisone or dehydrocorticosterone.

4,588,719

BICYCLIC BENZENOID AMINOALKYLENE ETHERS AND THIOETHERS, PHARMACEUTICAL COMPOSITIONS AND USE

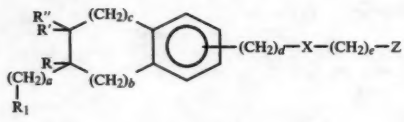
William L. Studt, Harleysville; Donald E. Kuhla, Doylestown, and Henry F. Campbell, Lansdale, all of Pa., assignors to William H. Rorer, Inc., Fort Washington, Pa.

Continuation-in-part of Ser. No. 604,813, Apr. 27, 1984, which is a continuation-in-part of Ser. No. 489,702, Apr. 29, 1983, Pat. No. 4,529,723. This application Oct. 24, 1984, Ser. No. 664,222

Int. Cl.[4] A61K *31/535, 31/135;* **C07C** *87/457;* **C07D** *295/12*

U.S. Cl. 514—212 **21 Claims**

1. A compound of the formula:



wherein:

a is 0, 1 or 2;

b is 0 or 1;

c is b, 1-b, 2-b or 3-b;

d is 0 or 1;

e is 2, 3 or 4;

X is oxygen, sulfur,

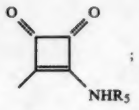
Z is $—NHR_4$;

R, R′ and R″ are each independently H, alkyl, or aralkyl;

R_1 is $—NR_2R_3$;

R_2 and R_3 are each independently H or alkyl, or both together with the nitrogen to which they are attached form a 5, 6 or 7-membered ring which may include one to three additional hetero atoms of N, O or S;

R_4 is selected from the group consisting of



R_5 is H or lower alkyl;

or a pharmaceutically acceptable salt thereof.

18. A method for decreasing acid secretion in the gastrointestinal tract of mammals by administering thereto an antisecretory effective amount of a compound according to claim 1.

4,588,720

IMIDAZO[1,2-A]PYRIMIDINES

Wilfred R. Tully, Cirencester, Great Britain, assignor to Roussel Uclaf, Paris, France

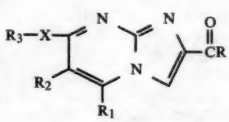
Division of Ser. No. 526,046, Aug. 24, 1983, Pat. No. 4,532,243. This application May 15, 1985, Ser. No. 734,590

Claims priority, application United Kingdom, Aug. 27, 1982, 8224606; Feb. 9, 1983, 8303612

Int. Cl.[4] A61K *31/415;* **C07D** *239/84, 471/02*

U.S. Cl. 514—217 **16 Claims**

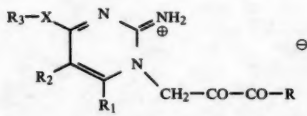
1. A compound selected from the group consisting of imidazo[1,2-a]pyrimidines of the formula



I

wherein R is selected from the group consisting of alkyl of 1 to 8 carbon atoms, alkenyl of 2 to 8 carbon atoms, cycloalkyl of 3 to 7 carbon atoms, cycloalkylalkyl of 4 to 12 carbon atoms, phenyl naphthyl, thienyl and pyridyl, each of said groups being optionally substituted with a member of the group consisting of halogen, alkyl of 1 to 5 carbon atoms, alkoxy and alkylthio of 1 to 5 carbon atoms, trifluoromethyl, amino, alkylamino of 1 to 5 alkyl carbon atoms and dialkylamino with alkyl of 1 to 5 carbon atoms, R_1 and R_2 taken together form alkylene of 3 to 5 carbon atoms optionally substituted with a member of the group consisting of halogen, alkyl of 1 to 5 carbon atoms, alkoxy and alkylthio of 1 to 5 carbon atoms, trifluoromethyl, amino, alkylamino of 1 to 5 alkyl carbon atoms and dialkylamino with alkyls of 1 to 5 carbon atoms, X is selected from the group consisting of oxygen and sulfur and R_3 is alkyl of 1 to 5 carbon atoms and their non-toxic, pharmaceutically acceptable acid addition salts.

7. A compound of the formula



wherein R, R_1, R_2, R_3 and X are as defined in claim 1 and $Y^{\ominus}$ is an anion.

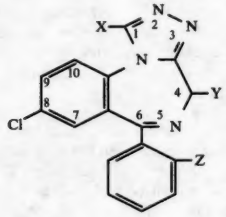
16. A method of inducing anxiolytic activity in warm-blooded animals comprising administering to warm-blooded animals an anxiolytically effective amount of at least one compound of claim 1.

4,588,721
TREATMENT OF NEGATIVE SYMPTOMS OF SCHIZOPHRENIA

Donald R. Mahan, San Jose, Calif., assignor to The Upjohn Company, Kalamazoo, Mich.

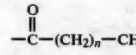
Continuation-in-part of Ser. No. 531,552, Sep. 12, 1983, abandoned. This application Nov. 26, 1984, Ser. No. 674,616
Int. Cl.[4] A61K *31/41*
U.S. Cl. 514—220 **18 Claims**

1. A process for preventing or treating the negative symptoms of schizophrenia comprising the administration to a human subject in need of such treatment, in unit dosage form, from about 0.01 mg to about 0.8 mg/kg body weight of a compound of the formula:

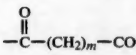


X is a member selected from the group consisting of —H, $—CH_3$, and $—CH_2—O—R$;

wherein R is hydrogen, alkyl of from 1 to 3 carbon atoms, inclusive



or



wherein n is 0 to 16, inclusive, and m is 1 to 16, inclusive;

Y is hydrogen or, provided when Z is hydrogen and X is CH_3, hydroxy;

Z is hydrogen or, provided when Y is hydrogen and X is $—CH_3$, chloro;

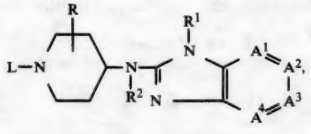
or the pharmacologically acceptable acid addition salt or a (5) N-oxide thereof in association with a pharmaceutical carrier.

4,588,722
N-(4-PIPERIDINYL) BICYCLIC CONDENSED 2-IMIDAZOLAMINE DERIVATIVES

Frans E. Janssens, Bonheiden; Joseph L. G. Torremans, Beerse; Jozef F. Hens, Nijlen, and Theophilus T. J. M. Van Offenwert, Vosselaar, all of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Continuation-in-part of Ser. No. 569,115, Jan. 9, 1984, abandoned. This application Oct. 15, 1984, Ser. No. 660,670
Int. Cl.[4] A61K *31/445*
U.S. Cl. 514—228 **9 Claims**

1. A chemical compound having the formula



(I)

a pharmaceutically acceptable acid addition salt or a possible stereochemically isomeric form thereof, wherein:

$A^1=A^2—A^3=A^4$ is a bivalent radical having the formula

—CH=CH—CH=CH—(a-1),

—N=CH—CH=CH—(a-2),

—CH=N—CH=CH—(a-3),

—CH=CH—N=CH—(a-4), or

—CH=CH—CH=N—(a-5),

wherein one or two hydrogen atoms in said radicals (a-1) - (a-5) may, each independently from each other, be replaced by halo, lower alkyl, lower alkyloxy, trifluoromethyl or hydroxy;

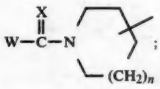
R is a member selected from the group consisting of hydrogen and lower alkyl;

R^1 is a member selected from the group consisting of hydrogen, alkyl, cycloalkyl, Ar^1 and lower alkyl substituted with one or two Ar^1 radicals;

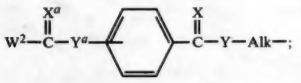
R^2 is a member selected from the group consisting of hydrogen, lower alkyl, cycloalkyl, (lower alkyl)—CO—, (lower alkyloxy)—CO— and Ar^2-lower alkyl; and

L is a radical of formula

(b-1)



(b-2)



(b-3)

(b-4)

(b-5)

(b-6)

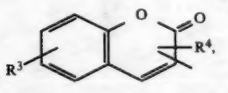
(i) where $A^1=A^2—A^3=A^4$ is a radical of formula (a-3), (a-4) or (a-5), or

(ii) where $A^1=A^2—A^3=A^4$ is a radical of formula (a-1) or (a-2), and R^1 is Ar^3 or lower alkyl substituted with one or two Ar^3 radicals, said Ar^3 being pyrazinyl, thiazolyl or imidazolyl, optionally substituted with lower alkyl:

L may also be a radical of formula:

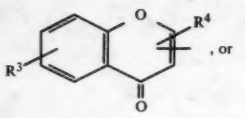
Ar^1-Alk- (b-7);

said W being a member selected from the group consisting of hydrogen, lower alkyl, Ar^1, Ar^1-lower alkyl, 1-piperidinyl, 1-pyrrolidinyl, 4-morpholinyl, a radical of formula



(c-1-a)

a radical of formula



(c-1-b)

a radical of formula

W^1-Z^1- (c-1-c),

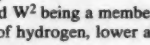
wherein R^3 and R^4 are each independently hydrogen or lower alkyl; and W^1 is cycloalkyl or lower alkyl, optionally substituted with up to two substituents selected from the group consisting of hydroxy, lower alkyloxy, 1-piperidinyl, 1-pyrrolidinyl, 4-morpholinyl and Ar^1; and where Z^1 is Nr^8, W^1 may also be hydrogen, amino, lower alkylamino, Ar^1-amino or nitro;

said W^2 being a member selected from the group consisting of hydrogen, lower alkyl, Ar^1 and a radical of formula:

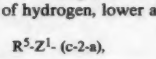
R^5-Z^1- (c-2-a),

wherein R^5 is hydrogen, lower alkyl or Ar^1;

said T being a radical of formula:



(c-3-a)



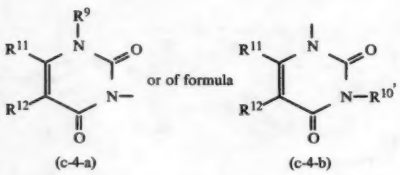
(c-3-b)

R^6 being hydrogen, lower alkyl or Ar^1;

R^7 being lower alkyl or Ar^1; and

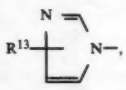
R^8 being hydrogen or lower alkyl;

said Het being a radical of formula (c-1-a), (c-1-b), or a radical of formula



(c-4-a) (c-4-b)

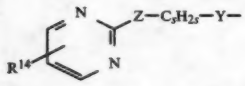
wherein R^9, R^{10}, R^{11} and R^{12} are each independently hydrogen or lower alkyl; or a radical of formula



(c-4-c)

wherein R^{13} is hydrogen, lower alkyl or amino, or

said Het being furan substituted with lower alkyl, said lower alkyl being optionally substituted with hydroxy, mercapto, lower alkyloxy, lower alkylthio, (aminolower alkyl)thio, Ar^1—*O— or a radical of formula*



(c-4-d-1)

s being an integer of from 1 to 6 inclusive; or where Z or Y is a direct bond, s may also be 0; and R^{14} being hydrogen or lower alkyl;

wherein:

n is 0 or the integer 1 or 2;

X is O, S, NR^{15} or $CHNO_2$;

Y is O, S, NR^{16} or a direct bond;

Y^1 is O, S or NR^{16};

Y^2 is S or NR^{16};

Z is O, S, NR^8 or a direct bond;

Z^1 is O, S or NR^8;

X^a and Y^a independently having the same meaning of X respectively Y;

said R^{15} being hydrogen, lower alkyl, cyano, nitro, Ar^2-sulfonyl, lower alkylsulfonyl, lower alkylcarbonyl or Ar^2-carbonyl;

said R^{16} being hydrogen, lower alkyl, (Ar^2)lower alkyl, 2-lower alkyloxy-1,2-dioxoethyl; or a radical of formula —C(=X)—R^{17}; R^{17} being hydrogen, lower alkyl, Ar^2, Ar^2-lower alkyl, lower alkyloxy, Ar^2-lower alkyloxy, mono- or di(lower alkyl)amino, Ar^2-lower alkylamino or Ar^2-lower alkyl(lower alkyl)amino;

provided that:

(i) when A^1=A^2—A^3=A^4 is a radical of formula (a-1) or (a-2), and L is a radical of formula (b-1), wherein W is other than hydrogen or other than a radical of formula (c-1-a) or (c-1-b), then X is other than O;

(ii) when L is a radical of formula (b-1), wherein W is a radical of formula (c-1-c), wherein Z^1 is NH then W^1 is other than hydrogen or lower alkyl;

(iii) when A^1=A^2—A^3=A^4 is a radical of formula (a-1) or (a-2), and L is a radical of formula (b-3), wherein X is O, Y is NR^{16}, O or a direct bond, and X^a is O,

(a) then Y^a is not O;

(b) and W^2 being lower alkyl then Y^a is not a direct bond;

wherein Ar^1 is a member selected from the group consisting of phenyl, being optionally substituted with up to three substituents each independently selected from the group consisting of halo, hydroxy, nitro, cyano, trifluoromethyl, lower alkyl, lower alkyloxy, lower alkylthio, mercapto, amino, mono- and di(lower alkyl)amino, carboxyl, lower alkyloxycarbonyl and lower alkyl-CO-; thienyl; halothienyl; furanyl; lower alkyl substituted furanyl; pyridinyl; pyrazinyl; thiazolyl and midazolyl optionally substituted with lower alkyl; and wherein Ar^2 is a member selected from the group consisting of phenyl being optionally substituted with up to three substituents each independently selected from the group consisting of halo, hydroxy, nitro, cyano, trifluoromethyl, lower alkyl, lower alkyloxy, lower alkylthio, mercapto, amino, mono- and di(lower alkyl)amino, carboxyl, lower alkyloxycarbonyl and (lower alkyl)-CO.

4,588,723

AMINOALKYL-IMIDAZOTHIADIAZOLE-ALKENECARBOXYLIC ACID AMIDES, INTERMEDIATES FOR THEIR PREPARATION AND THEIR USE IN MEDICAMENTS

Axel Ingendoh, Velbert; Horst Meyer, Wuppertal, and Bernward Garthoff, Hilden, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

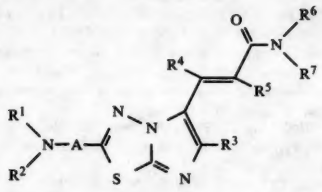
Filed Jul. 26, 1984, Ser. No. 634,851

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1983, 3329621

Int. Cl.[4] **A61K** *31/425;* **C07D** *513/04*

U.S. Cl. 514—231 **20 Claims**

1. A compound of the formula (I)



(I)

in which

R^1 denotes hydrogen, aryl or an aliphatic hydrocarbon radical which is optionally interrupted by O, S, N, N-alkyl or NH and is optionally substituted by hydroxyl, alkoxy, alkyl, trifluoromethyl, halogen, alkoxycarbonyl or dialkylamino, the two alkyl radicals optionally forming, together with the N atom, a 5-membered to 7-membered ring which is optionally interrupted by a heteroatom from the group comprising O, S, NH and N-aklyl, and these abovementioned alkyl and phenyl radicals in turn optionally being substituted by halogen, trifluoromethyl, alkyl, alkoxy, alkylmercapto or SO_2-aklyl,

R^2 has the meaning given for R^1, it being possible for R^2 and R^1 to be identical or different, or R^2 together with R^1 forms, with the nitrogen atom, a 5-membered to 7-membered saturated or unsaturated ring which optionally contains 1 or 2 further hetero-atoms from the group comprising oxygen, sulphur and nitrogen, the nitrogen optionally being substituted by hydrogen or alkyl, and it being possible for this 5-membered to 7-membered ring to be substituted by 1 to 4 identical or different substituents from the group comprising alkyl, halogen, aryl, aralkyl, alkoxycarbonyl, hydroxyalkyl, alkoxyalkyl and trifluoromethyl,

A represents a chain 1–4 carbon atoms which is optionally interrupted by a hetero-atom from the group comprising oxygen, sulphur and nitrogen and can be saturated or unsaturated or part of a 4-membered to 7-membered ring, and in which each nitrogen and carbon atom can be substituted by radicals R^1, which can be identical or different,

R^3 represents a phenyl, naphthyl, furyl, thienyl, pyrimidyl, pyrazinyl, quinolyl, isoquinolyl or pyridyl radical which is optionally substituted by 1 to 3 identical or different substituents from the group comprising halogen, nitro, trifluoromethyl, alkyl, alkoxy, dialkylamino and SO_n-alkyl (n=0, 1 or 2), the alkyl and alkoxy radicals mentioned in each case containing 1–4 carbon atoms,

R^4 represents hydrogen, trifluoromethyl or alkyl,

R^5 represents hydrogen, alkyl, cyano, halogen or CXR^8,

wherein

X denotes O or S and

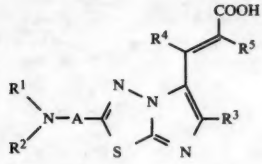
R^8 has the abovementioned meaning of R^1, and

R^6 and R^7 each have the meaning given for R^1 and are identical to or different from R^1, or together with the nitrogen atom form a 5-membered to 7-membered saturated or unsaturated ring which optionally contains 1 or 2 further hetero-atoms from the group comprising oxygen, sulphur and nitrogen, the nitrogen optionally being substituted by hydrogen, alkyl with 1 to 4 carbon atoms, phenyl or benzyl,

and its stereoisomeric forms of the various enantiomers, diastereomers and E/Z isomers and its pharmaceutically acceptable acid addition salts.

16. A method of effecting hypotension, diuresis or uricosuria in warm-blooded animals which comprises administering to the animals an effective amount of an active compound according to claim **1**, either alone or in admixture with an inert pharmaceutical carrier or in the form of a medicament.

20. Alkenecarboxylic acids of the formula (VI)



(VI)

in which

R^1 denotes hydrogen, aryl or an aliphatic hydrocarbon radical which is optionally interrupted by O, S, N, N-alkyl, NH, N-aryl or N-aralkyl and is optionally substituted by hydroxyl, alkoxy, alkyl, trifluoromethyl, halogen, phenyl, alkoxycarbonyl or dialkylamino, it being possible for the two alkyl radicals optionally to form, together with the N atom, a 5-membered to 7-membered ring, which is optionally interrupted by a hetero-atom from the group comprising O, S, NH and N-alkyl, and these abovementioned alkyl and phenyl radicals in turn optionally being substituted by halogen, trifluoromethyl, alkyl, aryl, aralkyl, alkoxy, alkylmercapto or SO_2-alkyl,

R^2 has the meaning given for R^1, it being possible for R^2 and R^1 to be identical or different, or R^2 together with R^1 forms, with the nitrogen atom, a 3-membered to 8-membered saturated or unsaturated ring which optionally contains 1 or 2 other hetero-atoms from the group comprising oxygen, sulphur and nitrogen, the nitrogen optionally being substituted by hydrogen, alkyl, aryl or aralkyl, and it being possible for this 3-membered to 8-membered ring to be substituted by 1 to 4 identical or different substituents from the group comprising alkyl, halogen, aryl, aralkyl, alkoxycarbonyl, hydroxyalkyl, alkoxyalkyl and trifluoromethyl, or it being possible for this ring to be fused with an aromatic ring,

A represents a chain of 1–4 carbon atoms which is optionally interrupted by 1 or 2 hetero-atoms from the group comprising oxygen, sulphur and nitrogen and can be saturated or unsaturated or part of a 3-membered to 8-membered ring, and in which each nitrogen and carbon atom can be substituted by radicals R^1, which can be identical or different,

R^3 has the meaning given for R^1 and is identical to or different from R^1, or represents furyl, phenyl, thienyl, pyrimidyl, pyrazinyl, quinolinyl, isoquinolinyl or pyridyl, the rings optionally being substituted by 1, 2 or 3 identical or different substituents from the group comprising alkyl, aryl, alkoxy, halogen, nitro, trifluoromethyl, SO_n-alkyl (n=0, 1 or 2) or NR^9R^{10},

wherein

R^9 and R^{10} have the abovementioned means of R^1 and R^2,

R^4 represents hydrogen, trifluoromethyl or alkyl and

R^5 represents hydrogen, alkyl, cyano, halogen, nitro, SO_n-alkyl (N=0, 1 or 2) or CXR^8,

wherein

X denotes O or S and

R^8 has the abovementioned meaning of R^1.

4,588,724

TREATMENT FOR SELECTIVE REDUCTION OF REGIONAL FAT DEPOSITS

Frank L. Greenway, III, 4560 Admiralty Way, Suite 301, Marina Del Rey, Calif. 90291, and George A. Bray, 234 S. Figueroa, #1035, Los Angeles, Calif. 90012

Division of Ser. No. 448,836, Dec. 10, 1982, Pat. No. 4,525,359. This application Jan. 11, 1985, Ser. No. 690,651

Int. Cl.[4] **A61K** *31/44, 31/50, 31/445, 31/495*

U.S. Cl. 514—250 **14 Claims**

1. A process for achieving a selective reduction in body weight, comprising the steps of:

delivering specifically to the portion of the body where

weight reduction is sought a therapeutically effective amount of an alpha-2 adrenergic inhibitor; and

accomplishing a general weight loss program, whereby an acceleration of weight loss is achieved from the portion of the body to which the active ingredient was selectively delivered.

4,588,725

2-PIPERAZINYL-QUINAZOLINE DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Peter Neumann, Berne, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

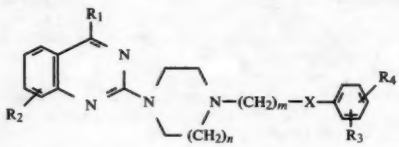
Filed Nov. 10, 1983, Ser. No. 550,909

Claims priority, application Switzerland, Nov. 12, 1982, 6614/82

Int. Cl.⁴ A61K *31/505;* **C07D** *403/08*

U.S. Cl. 514—254 **9 Claims**

1. A compound of formula I,



I

wherein

R_1 is hydrogen, (C_{1-6})alkyl, (C_{3-7})cycloalkyl or phenyl, the phenyl ring optionally being monosubstituted by halogen, (C_{1-4})alkyl or (C_{1-4})alkoxy,

R_2 is hydrogen, halogen, hydroxy, (C_{1-6})alkyl, (C_{1-4})alkoxy or benzyloxy,

n is 1 or 2,

R_3 and R_4 are each, independently, hydrogen, halogen, (C_{1-4})alkyl, (C_{1-4})alkoxy, (C_{2-4})acyl or trifluoromethyl, and

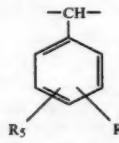
X is —CH_2— and m is 0, 1, 2 or 3, or

X is —CHOH— and m is 2 or 3, or

X is —CO— or a protected —CO— group and m is 1, 2 or 3, or

X is —O— and m is 2 or 3, or

X is a group of formula II,



II

wherein R_5 and R_6 are each, independently, hydrogen, halogen, (C_{1-4})alkyl, (C_{1-4})alkoxy or trifluoromethyl and m is 3, or a pharmaceutically acceptable acid addition salt thereof.

8. A method of treating schizophrenia which comprises administering a therapeutically effective amount of a compound of claim **1** or a pharmaceutically acceptable acid addition salt thereof to a subject in need of such treatment.

4,588,726

1-CYCLOPROPYL-6-FLUORO-1,4-DIHYDRO-4-OXO-7-(3-OXO-1-PIPERAZINYL)-3-QUINOLINECARBOXYLIC ACID ANTIBACTERIAL AGENTS

Uwe Petersen, Leverkusen; Klaus Grohe, Odenthal; Hans-Joachim Zeiler, Velbert, and Karl G. Metzger, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

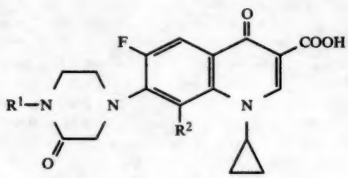
Filed May 17, 1985, Ser. No. 735,499

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1984, 3420770

Int. Cl.⁴ A61K *31/495;* **C07D** *401/02*

U.S. Cl. 514—254 **10 Claims**

1. A 1-cyclopropyl-6-fluoro-1,4-dihydro-4-oxo-7-(3-oxo-1-piperazinyl)-3-quinolinecarboxylic acid of the formula



in which

R^1 is hydrogen, methyl or ethyl, and

R^2 is hydrogen or fluorine, or a pharmaceutically tolerable hydrate or salt thereof.

8. A method of combating bacteria which comprises applying to such bacteria or to a bacterial host or habitat an antibacterially effective amount of a compound, hydrate or salt according to claim **1**.

4,588,727

INTERMEDIATES FOR PYRROLO[1,2-B][1,2,5]TRIAZEPINES

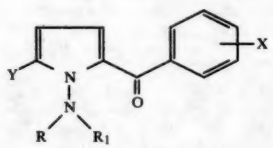
Richard C. Effland; Joseph T. Klein, both of Bridgewater, and R. Richard L. Hamer, Budd Lake, all of N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Division of Ser. No. 627,329, Jul. 2, 1984, Pat. No. 4,517,195. This application Feb. 4, 1985, Ser. No. 698,196

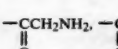
Int. Cl.⁴ A61K *31/40;* **C07D** *207/50*

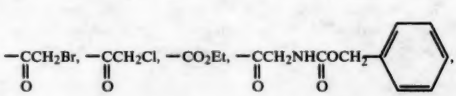
U.S. Cl. 514—255 **83 Claims**

1. A compound of the formula

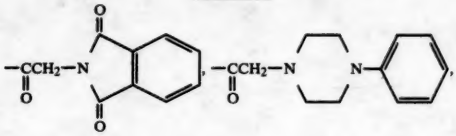


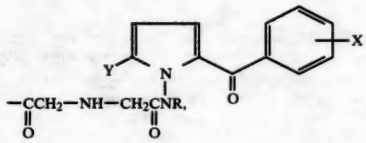
where X is hydrogen, halogen, loweralkyl, CF_3 or NO_2; Y is hydrogen, halogen or loweralkyl; R is hydrogen, loweralkyl, loweralkylaminoloweralkyl, diloweralkylaminoloweralkyl; and R_1 is hydrogen,



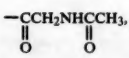


-continued



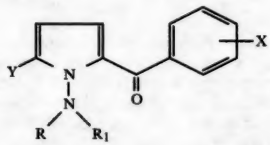


or

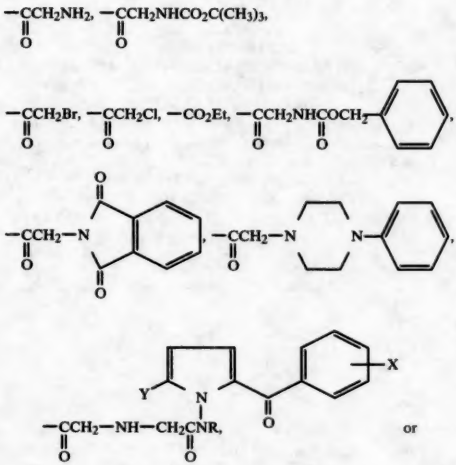


or a pharmaceutically acceptable acid addition salt thereof.

83. A pharmaceutical composition comprising a pharmaceutically effective amount of a compound of the formula



where X is hydrogen, halogen, loweralyl, CF_3 or NO_2; Y is hydrogen, halogen or loweralyl; R is hydrogen, loweralkyl, loweralkylaminoloweralkyl, or diloweralylaminoloweralkyl; and R_1 is hydrogen,



or

or a pharmaceutically acceptable acid addition salt thereof and a carrier therefor.

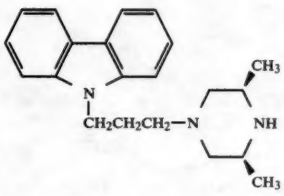
4,588,728

TREATMENT OF DRUG INDUCED PSYCHOSIS

Robert M. Ferris, Cary, N.C., assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed Mar. 27, 1985, Ser. No. 716,752
Int. Cl.[4] A61K *31/495*
U.S. Cl. 514—255 3 Claims

1. A method of treating a human patient identified as suffering from psychosis induced by phencyclidine (or an acid addition salt thereof) or identified as having taken a psychosis inducing amount of phencyclidine (or an acid addition salt thereof) comprising the administration to said patient of an effective phencyclidine induced psychosis reversing amount of the compound of formula (I) or a pharmaceutically acceptable salt thereof



(I)

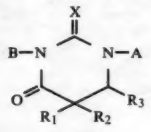
4,588,729

TREATING CONVULSIONS WITH DIHYDROURACIL DERIVATIVES

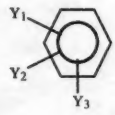
Masayuki Teranishi; Chikara Murakata, both of Machida; Ikuo Matsukuma, Susono; Katsuichi Shuto, and Shunji Ichikawa, both of Shizuoka, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed May 16, 1985, Ser. No. 734,607
Claims priority, application Japan, May 16, 1984, 59-98193
Int. Cl.[4] A61K *31/52*
U.S. Cl. 514—263 14 Claims

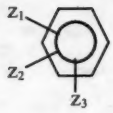
1. A method for treating convulsion of a mammal which comprises administering to the mammal an effective amount of a composition consisting essentially of a dihydrouracil derivative represented by the formula:



wherein one of A and B is



wherein Y_1, Y_2 and Y_3 are hydrogen atoms, lower alkyl groups, halogen atoms, nitro groups, amino groups, carboxyl groups, lower alkoxycarbonyl groups or trifluoromethyl groups, a naphthyl group or a diphenylmethyl group, and the other is a hydrogen atom, a lower alkyl group, a lower alkenyl group, a cyclopentyl group, a cyclohexyl group or



wherein Z_1, Z_2 and Z_3 are hydrogen atoms, lower alkyl groups, halogen atoms or trifluoromethyl groups, R_1, R_2 and R_3 are hydrogen atoms or lower alkyl groups, and X is an oxygen atom or a sulfur atom and at least one pharmaceutically acceptable carrier.

4,588,730

PYRAZOLO[3,4,5-K1]ACRIDINE COMPOSITIONS AND METHODS FOR THEIR USE AS ANTIMICROBIALS

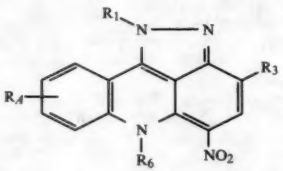
David B. Capps, Ann Arbor, Mich., assignor to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 619,258, Jun. 15, 1984, Pat. No. 4,555,572, which is a continuation-in-part of Ser. No. 545,125, Jul. 19, 1983, abandoned. This application Aug. 22, 1985, Ser. No. 768,310

Int. Cl.[4] **A61K** *31/44;* **C07D** *401/04, 219/06, 219/08*

U.S. Cl. 514—287 **2 Claims**

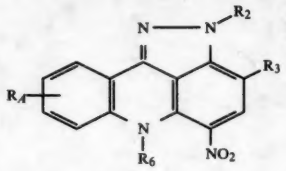
1. A method for treating microbial infection in a mammal which comprises administering a sufficient amount of a compound of formula 1:



1

where R_1 is each—alkylene—NR_xR_y where alkylene is two or four carbon straight or branched chain alkylene which can be substituted by hydroxyl, and R_x and R_y are each independently H, one to four carbon straight or branched chain alkyl, or two to four carbon straight or branched chain hydroxyalkyl, or combined with said nitrogen represent piperidyl or pyrrolidyl, when R_x and R_y are both alkyl, the amine may be an N-oxide; R_3 is H or NO_2; R_6 is H or one to three carbon straight or branched chain alkyl; R_4 is H or one or two groups selected from hydroxy, chloro, amino, one to four carbon straight or branched alkylamino or dialkylamino optionally substituted by methoxy, one to four carbon straight or branched alkyl; one to six carbon straight or branched alkoxy which may be substituted by methoxy, dimethylaminoethoxy, dimethylaminopropoxy, diethylaminoethoxy, diethylaminopropoxy, benzyloxy or benzyloxy substituted by methoxy, three to ten carbon straight or branched trialkylsilyloxy, two to twelve carbon straight or branched alkanoyloxy which may be substituted by methoxy, benzoyloxy or benzoloxy substituted by methoxy, one to four carbon straight or branched alkoxycarbonyloxy, benzyloxycarbonyloxy one to four carbon straight or branched alkylaminocarbonyloxy or dialkylaminocarbonyloxy, in combination with a pharmaceutically acceptable carrier, to a mammal in need thereof.

2. A method for treating microbial infection in a mammal which comprises administering a sufficient amount of a compound of formula 2:



2

where R_2 is each—alkylene—NR_xR_y where alkylene is two to four carbon straight or branched chain alkylene which can be substituted by hydroxyl, and R_x and R_y are each independently H, one to four carbon straight or branched chain alkyl, or two to four carbon straight or branched chain hydroxyalkyl, or combined with said nitrogen represent piperidyl or pyrrolidyl, when R_x and R_y are both alkyl, the amine may be an N-oxide; R_3 is H or NO_2; R_6 is H or one to three carbon straight or branched chain alkyl; R_4 is H or one or two groups selected from hydroxy, chloro, amino, one to four carbon straight or branched alkylamino or dialkylamino optionally substituted by emthoxy, one to four carbon straight or branched alkyl; one to six carbon straight or branched alkoxy which may be substituted by methoxy, dimethylaminoethoxy, dimethylaminopropoxy, diethylaminoethoxy, diethylaminopropoxy, benzyloxy or benzyloxy substituted by methoxy, three to ten carbon straight or branched trialkylsilyloxy, two to twelve carbon straight or branched alkanoyloxy which may be substituted by methoxy, benzoyloxy or benzoloxy substituted by methoxy, one to four carbon straight or branched alkoxycarbonyloxy, benzyloxycarbonyloxy one to four carbon straight or branched alkylaminocarbonyloxy or dialkylaminocarbonyloxy, in combination with a pharmaceutically acceptable carrier, to a mammal in need thereof.

4,588,731

DERIVATIVES OF ISOXAZOLO[4,5-C]QUINOLINE(2H)-3-ONE AND METHOD OF PREPARATION AND USE AS ANXIOLYTIC AGENTS

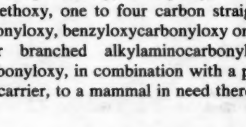
Daniel Humbert, Fontenay-sous-Bois; Jean-Claude Gasc, Bondy, and Peter F. Hunt, Gonesse, all of France, assignors to Roussel Uclaf, Paris, France

Filed Jun. 21, 1985, Ser. No. 747,665

Int. Cl.[4] **A61K** *31/42;* **C07D** *498/02, 215/00*

U.S. Cl. 514—293 **21 Claims**

1. A isoxazoloquinolinones of the formula



I

wherein R is selected from the group consisting of hydrogen, fluorine, chlorine, bromine, alkyl and alkoxy of 1 to 5 carbon atoms, —NO_2 and CF_3— and R_1 is phenyl optionally substituted by at least one member selected from the group consisting of halogen and alkyl and alkoxy of 1 to 5 carbon atoms,

14. A method of relieving anxiety in warm-blooded animals comprising administering to warm-blooded animals an anxiolytically effective amount of at least one compound of claim 1.

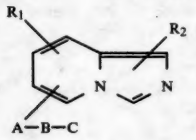
4,588,732

CERTAIN IMIDAZO(1,5-A)PYRIDINE DERIVATIVES AND THEIR USE AS THROMBOXANE SYNTHETASE INHIBITORS

Leslie J. Browne, Morris Plains, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 21, 1982, Ser. No. 451,902
Int. Cl.[4] A61K *31/44*; C07D *471/04*
U.S. Cl. 514—300 21 Claims

1. A compound of the formula



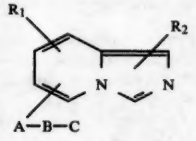
(I)

wherein the group -A-B-C is attached at the 5-position of the imidazo[1,5-a]pyridine nucleus or a 5,6,7,8-tetrahydro derivative thereof, wherein R_1 is hydrogen, halogen, lower alkyl, lower alkoxy, hydroxy or aryl-lower alkoxy in which aryl represents phenyl or phenyl substituted by lower alkoxy, lower alkyl, halogen or trifluoromethyl; R_2 represents hydrogen, halogen, or lower alkyl; C represents carboxy, lower alkoxycarbonyl, unsubstituted or mono- or di-(lower alkyl)substituted carbamoyl, cyano, formyl, hydroxymethyl, 5-tetrazolyl, 4,5-dihydro-2-oxazolyl, 4,5-dihydro-2-oxazolyl substituted by lower alkyl, or hydroxycarbamoyl; and

(a) A represents ethenylene or ethenylene substituted by lower alkyl; and B is alkynylene or alkenylene of 2 to 12 carbon atoms each, phenylene-lower alkylene, phenylene-lower alkenylene or phenylene-(thio or oxy)-lower alkylene; or

(b) A represents a direct bond; and B represents phenylene-lower alkylene, lower alkylene-(thio or oxy)-lower alkylene, phenylene-(thio or oxy)-lower alkylene, phenylene-lower alkenylene, lower alkylenephenylene-lower alkenylene, or lower alkylene-butadienylene; or a pharmaceutically acceptable salt thereof.

16. A method of selectively inhibiting the synthesis of thromboxane for the treatment of cardiovascular and respiratory disorders in a mammal comprising the administration to said mammal in need thereof of a thromboxane synthetase inhibiting pharmaceutical composition suitable for oral or parenteral administration comprising an effective amount of a compound of the formula



(I)

or a 5,6,7,8-tetrahydro derivative thereof, wherein R_1 is hydrogen, halogen, lower alkyl, lower alkoxy, hydroxy or aryl-lower alkoxy in which aryl represents phenyl or phenyl substituted by lower alkoxy, lower alkyl, halogen or trifluoromethyl; R_2 represents hydrogen, halogen, or lower alkyl; C represents carboxy, lower alkoxycarbonyl, unsubstituted or mono- or di-(lower alkyl)-substituted carbamoyl, cyano, formyl, hydroxymethyl, 5-tetrazolyl, 4,5-dihydro-2-oxazolyl, 4,5-dihydro-2-oxazolyl substituted by lower alkyl, or hydroxycarbamoyl; and

(a) A represents ethenylene or ethenylene substituted by lower alkyl; and B is alkynylene or alkenylene of 2 to 12 carbon atoms each, phenylene-lower alkylene, phenylene-lower alkenylene, phenylene, phenylene-(thio or oxy)-lower alkylene; or

(b) A represents a direct bond; and B represents lower alkylenephenylene, phenylene-lower alkylene, phenylene, lower alkylene-(thio or oxy)-lower alkylene, lower alkylene-(thio or oxy)-phenylene, phenylene-(thio or oxy)-lower alkylene, phenylene-lower alkenylene, lower alkylenephenylene-lower alkenylene, or lower alkylene-butadienylene; or a pharmaceutically acceptable salt thereof; in combination with one or more pharmaceutically acceptable carriers.

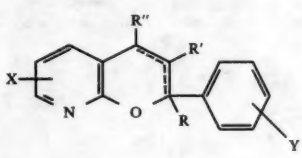
4,588,733

2-PHENYLPYRANO[2,3-B]PYRIDINES AND THEIR USE IN INHIBITING VIRUSES

Thomas M. Bargar, Zionsville, and John K. Daniel, Indianapolis, both of Ind., assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Filed Oct. 19, 1984, Ser. No. 663,020
Int. Cl.[4] A61K *31/44*; C07D *491/052*
U.S. Cl. 514—302 16 Claims

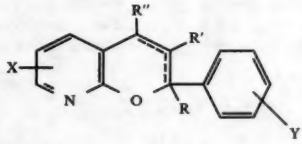
1. A compound of the formula



I

wherein R, R′ and R″ are each hydrogen or lower alkyl of 1–4 carbon atoms; X is chloro, bromo, alkylthio, alkylsulfinyl, alkylsulfonyl, hydroxy, alkoxy, benzoyl, acetyl or alkyl; Y is halo, di- or tri-chloro, alkyl, alkoxy, methylenedioxy, or phenoxy; the dotted line indicates the optional presence of a double bond at the 2,3- or 3,4- positions; with the proviso that when the dotted line represents a double bond at the 2,3-position then the R-group is not present.

16. A method for inhibiting viruses which comprises contacting viruses or virus host cells with an effective virus inhibiting amount of a compound of the formula:



I

wherein R, R′ and R″ are each hydrogen or lower alkyl of 1–4 carbon atoms; X is hydrogen, chloro, bromo, alkylthio, alkylsulfinyl, alkylsulfonyl, hydroxy, alkoxy, benzoyl, acetyl or alkyl; Y is hydrogen, halo, di- or tri-chloro, alkyl, alkoxy, methylenedioxy, or phenoxy; the dotted line indicates the optional presence of a double bond at the 2,3- or 3,4-positions; with the proviso that when the dotted line represents a double bond at the 2,3-position then the R-group is not present.

4,588,734

BLOOD PRESSURE LOWERING N-PYRIDYL-, N-QUINOLYL-, AND N-PIPERDYL-N-ACYL AMINO ACID DERIVATIVES AND METHOD

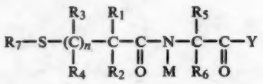
John T. Suh, Greenwich, Conn.; Jerry W. Skiles, Tuckahoe, N.Y.; Bruce E. Williams, Cottage Crove, Minn., and Alfred Schwab, Williston Park, N.Y., assignors to USV Pharmaceutical Corp., Tarrytown, N.Y.

Division of Ser. No. 323,852, Nov. 23, 1981, Pat. No. 4,507,312, which is a division of Ser. No. 200,180, Oct. 24, 1980, Pat. No. 4,304,771, which is a continuation-in-part of Ser. No. 57,175, Jul. 13, 1979, Pat. No. 4,256,761. This application Nov. 19, 1984, Ser. No. 672,645

Int. Cl.[4] A61K *31/445, 31/47;* **C07D** *215/38, 213/75*

U.S. Cl. 514—311 **7 Claims**

1. A compound of the structure:



wherein

R_1,R_2,R_3,R_4,R_5 and R_6 are independently hydrogen, alkyl, alkenyl containing 2 to 6 carbon atoms, alkynyl containing 2 to 6 carbons atoms, phenyl-alkyl or cycloalkyl containing 3 to 16 carbon atoms,

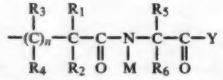
n is an integer from 0 to 4 inclusive,

M is selected from the group consisting of pyridyl, quinolyl or piperidyl,

Y is hydroxy, alkoxy, amino, aminoalkanoyl, hydrocarbylaryloxy containing from 6 to 10 carbon atoms, aminoalkoxy, or hydroxyalkoxy, and

R_7 is hydrogen, alkanoyl, carboxyalkanoyl, hydroxyalkanoyl, amino-alkanoyl, cyano, amidino, carbalkoxy, ZS, or

wherein Z is hydrogen, alkyl,hydroxyalkyl, aminoalkyl or the radical



wherein R_1,R_2,R_3,R_4,R_5,R_6,n,M and Y are as described above, and the alkyl groups per se and alkyl moieties of groups containing an alkyl group, contain 1 to 6 carbon atoms; or, where Y is hydroxy, its nontoxic, pharmaceutically acceptable alkali metal, alkaline earth metal, or amine salt.

7. A method of reducing the blood pressure in mammals having hypertension which comprises administering to said animals an effective amount of a compound according to claim **1**.

4,588,735

FUNGICIDAL (TRIHALOPHENOXY OR TRIHALOPHENTHIO) ALKYLAMINOALKYL PYRIDINES AND PYRROLES

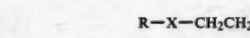
David M. Spatz, Fairfax, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Feb. 28, 1983, Ser. No. 470,824

Int. Cl.[4] A01N *43/36, 43/40;* **C07D** *213/38, 207/335*

U.S. Cl. 514—357 **21 Claims**

1. A compound of the formula:



wherein X is sulfur or oxygen; R is trihalophenyl; R^1 is lower alkyl or lower alkoxyalkyl; and R^2 is an 5- or 6-membered aromatic heterocyclic ring having 1 ring nitrogen and the remainder of the ring atoms carbon atoms, optionally substituted with 1 to 2 independent lower alkyl groups or the group $—CH_2R^3$ where R^3 is a 5- or 6-membered aromatic heterocyclic ring having 1 ring nitrogen and the remainder of the ring atoms carbon atoms, provided that the ring nitrogen of R^2 or R^3 is not bonded to the adjacent $—CH_2—$ group.

10. A method of controlling fungi which comprises contacting said fungi or their growth environment with a fungicidally effective amount of a compound of claim **1**.

4,588,736

ANALGESIC 1-ACETONYL-2-(PHENYLIMINO)-IMIDAZOLIDINES AND SALTS THEREOF

Franz Esser; Herbert Köppe, both of Ingelheim am Rhein; Wolfgang Abele, Waldalgesheim, and Klaus Stockhaus, Bingen am Rhein, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim KG, Ingelheim am Rhein, Fed. Rep. of Germany

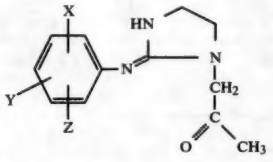
Filed May 21, 1984, Ser. No. 612,340

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1983, 3321282

Int. Cl.[4] A61K *31/415;* **C07D** *233/50*

U.S. Cl. 514—392 **5 Claims**

1. A compound of the formula



wherein

X, Y and Z are each independently hydrogen, halogen, lower alkyl, perhalogenated lower alkyl, lower alkoxy, perhalogenated lower alkoxy or (lower alkyl)thio, or

Y and Z, together with each other, are lower alkylenedioxy;

or a non-toxic, pharamcologically acceptable acid addition salt thereof.

5. The method of raising the pain threshold of a warm-blooded animal in need thereof, which comprises perorally, parenterally or rectally administering to said animal an effective amount of a compound of claim **1**.

4,588,737

ANTIALLERGIC BIS-IMIDAZOLINOAMINO DERIVATIVES

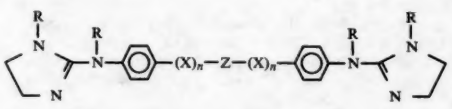
Fu-chih Huang, Leonia, N.J., assignor to USV Pharmaceutical Corp., Tarrytown, N.Y.

Filed Dec. 20, 1984, Ser. No. 684,214

Int. Cl.[4] A61K *31/415;* **C07D** *233/50*

U.S. Cl. 514—392 **13 Claims**

1. A compound of the formula



or pharmaceutically acceptable salt thereof; wherein:

Z is an unsubstituted normal alkylene chain of up to 8 carbon atoms or a substituted normal alkylene chain in which the substituent is lower alkyl, phenyl or benzyl of up to 8 carbon atoms in the normal chain and up to a total of about 12 carbon atoms;

X=O or S;

n=0 or 1;

each R is H, lower alkyl or lower alkanoyl; and

the phenyl groups separated by —(X)n—Z—(X)n— may optionally be substituted by methyl or chloro.

13. An anti-inflammatory composition comprising an anti-inflammatory effective amount of compound according to claim 1 and a pharmaceutical carrier therefor.

4,588,738

N-IMIDAZOLYL DERIVATIVES OF 1,2,3,4-TETRAHYDRO-NAPHTHALENE AND INDAN AS PLATELET AGGREGATION INHIBITORS

Paolo Cozzi; Antonio Pilan, and Pier P. Lovisolo, all of Milan, Italy, assignors to Farmitalia Carlo Erba S.p.A., Milan, Italy

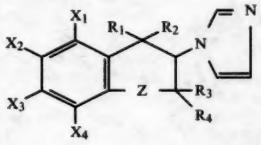
Division of Ser. No. 398,545, Jul. 15, 1982, Pat. No. 4,492,707. This application Jun. 1, 1984, Ser. No. 616,145

Claims priority, application United Kingdom, Jul. 23, 1981, 8122689; Aug. 5, 1981, 8123920

Int. Cl.[4] A61K *31/415*

U.S. Cl. 514—399 **12 Claims**

1. A pharmaceutical composition having anti-aggregating activity containing a suitable carrier and/or diluent and a therapeutically effective amount of a compound of formula (I)



(I)

wherein:

Z completes a bond or is a

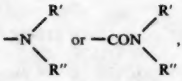
group,

wherein each of R_5 and R_6, being the same or different, is hydrogen or C_1–C_4 alkyl;

one of R_1 and R_2 is hydroxy and the other is hydrogen or C_1–C_6 alkyl, or R_1 and R_2, taken together, form an oxo group;

one of R_3 and R_4 is hydrogen or C_1–C_4 alkyl and the other represents hydrogen or:

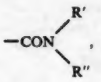
(a) C_1–C_8 alkyl, unsubstituted or substituted by one or more substituents chosen from halogen; hydroxy, cyano; —COOR′, wherein R′ is hydrogen or C_1–C_6 alkyl;



wherein each of R′ and R″, being the same or different, represents hydrogen or C_1–C_6 alkyl;

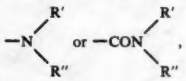
(b) straight or branched C_1–C_4 alkyl or C_2–C_4 alkenyl, each substituted by a C_1–C_4 alkyl, or a C_3–C_7 monocycloalkyl;

(c) cyano; —COR′, —OR′, —COOR′ or



wherein R′ and R″ are as defined above;

each of X_1, X_2, X_3, and X_4, which may be the same or different, is hydrogen; halogen; hydroxy; nitro; cyano, C_1–C_6 alkyl; C_2–C_6 alkenyl; C_1–C_6 alkoxy; trihalo—C_1–C_6 alkyl; —SR′, —S—S—R′, COOR′,



R′ and R″ being as defined above; or a C_2–C_4 acylamino group; or one of X_1, X_2, X_3 and X_4 is phenyl, phenylthio, phenoxy or benzyl, the phenyl, phenylthio, phenoxy or benzyl groups being unsubstituted or substituted by one or more substituents chosen from halogen, C_1–C_6 alkyl, hydroxy, C_1–C_6 alkoxy, —SR′ or —S—S—R′, wherein R′ is as defined above, and the others are as defined above; or any two adjacent X_1, X_2, X_3 and X_4 groups, taken together, complete a saturated or unsaturated 6-membered carbocyclic ring fused to the benzene ring shown in formula (1), the carbocyclic ring being unsubstituted or substituted by one or more substituents selected from halogen, C_1–C_6 alkyl, halo—C_1–C_6 alkyl, C_1–C_6 alkoxy, —SR′ or —S—S—R′, wherein R′ is as defined above, and any groups X_1 to X_4 not participating in the completion of such a fused ring are as defined above; provided that:

when Z is a group

and, at the same time, at least one of R_3 and R_4 is different from hydrogen, then R_5 and R_6 are both hydrogen; and

when Z is a group

and, at the same time, at least one of R_5 and R_6 is different from hydrogen, then R_3 and R_4 are both hydrogen, or a pharmaceutically acceptable salt thereof.

4,588,739

METHOD OF PREVENTING WITHDRAWAL SYMPTOMS ASSOCIATED WITH THE CESSATION OR REDUCTION OF TOBACCO SMOKING

Alexander H. Glassman, Teaneck, N.J., assignor to Research Foundation for Mental Hygiene, Inc., New York, N.Y.

Filed Mar. 2, 1984, Ser. No. 585,900

Int. Cl.[4] A61K *31/415*

U.S. Cl. 514—401 **9 Claims**

1. A method of reducing, in a human subject accustomed to the regular or habitual smoking of tobacco, the withdrawal symptoms associated with the cessation or reduction of tobacco smoking which comprises administering to the subject an effective symptom-preventing amount of a compound selected from the group consisting of tiamendine and clonidine hydrochloride for a suitable period of time.

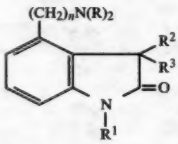
4,588,740

PHARMACEUTICAL METHODS USING 4-AMINOALKYL-2(3H)-INDOLONES

Gregory Gallagher, Jr., Jeffersonville, Pa., assignor to Smith-Kline Beckman Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 447,564, Dec. 7, 1982, Pat. No. 4,452,808. This application Apr. 5, 1984, Ser. No. 597,006
Claims priority, application Canada, Nov. 17, 1983, 441416
Int. Cl.[4] A61K *31/40;* **C07D** *209/32*
U.S. Cl. 514—418 **13 Claims**

1. The method of treating hypertension, angina pectoris, congestive heart failure or kidney dysfunction by inducing D_2-receptor agonist activity comprising administering orally, rectally or parenterally to a patient subject to one of these abnormal conditions a nontoxic, active therefor quantity of a compound of the structural formula;



in which:

R is, each, hydrogen, lower alkyl, benzyl, allyl, phenethyl or 4-hydroxyphenethyl;

R^1, R^2 and R^3 are each hydrogen or C_{1-4}-lower alkyl; and

n is 1, 2 or 3; or a pharmaceutically acceptable acid addition salt thereof, in dosage unit form, combined with a pharmaceutical carrier.

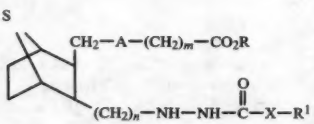
4,588,741

PLATELET AGGREGATION INHIBITING AND BRONCHOCONSTRICTION INHIBITING THIABICYCLOHEPTANE SUBSTITUTED AMINO PROSTAGLANDIN ANALOG DERIVATIVES, COMPOSITIONS, AND METHOD OF USE THEREFOR

Masami Nakane, Hopewell, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Feb. 28, 1985, Ser. No. 706,813
Int. Cl.[4] A61K *31/38;* **C07D** *495/08*
U.S. Cl. 514—443 **15 Claims**

1. A compound having the structural formula



and including all stereoisomers thereof, wherein A is —CH=CH— or $-(CH_2)_2-$;

m is 1 to 8; n is 1 to 4;

R is hydrogen, lower alkyl, alkali metal, or a polyhydroxylamine salt; X is O,CH_2 or NH; R^1 is H (where X≠O), lower alkyl, aryl, aralkyl, cycloalkyl or cycloalkylalkyl, wherein the term aryl by itself or as part of another group contains 6 to 10 carbons and is phenyl or naphthyl, each of which is unsubstituted or substituted with 1 or 2 lower alkyl groups, 1 or 2 halogens, 1 or 2 lower alkoxy groups, 1 or 2 hydroxy groups, 1 or 2 alkylamino groups, 1 or 2 alkanoylamino groups, 1 or 2 arylcarbonylamino groups, 1 or 2 amino groups, 1 or 2 nitro groups, 1 or 2 cyano groups, 1 or 2 thiol groups and/or 1 or 2 alkylthio groups.

11. A method of inhibiting platelet aggregation and bronchoconstriction, which comprises parenterally administering to the circulatory system of a mammalian host an effective amount of a compound as defined in claim 1 or a pharmaceutically acceptable salt thereof.

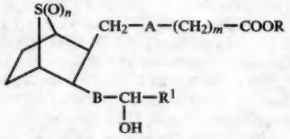
4,588,742

THIABICYCLOHEPTANE SUBSTITUTED PROSTAGLANDIN ANALOGS USEFUL IN THE TREATMENT OF THROMBOTIC DISEASE

Masami Nakane, Hopewell, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Feb. 20, 1985, Ser. No. 703,624
Int. Cl.[4] A61K *31/38;* **C07D** *333/50*
U.S. Cl. 514—443 **18 Claims**

1. A compound having the structural formula



wherein n is 0 or 1; A is —CH_2—CH_2 or —CH=CH—; m is 0 to 7; B is —CH=CH— or $(CH_2)_2$; R is H, lower alkyl, alkali metal or protonated polyhydroxylamine; and R^1 is lower alkyl, aryl, aralkyl, cycloalkyl or cycloalkylalkyl, wherein the term lower alkyl or alkyl by itself or as part of another group contains 1 to 12 carbons and is unsubstituted or substituted with halo, trifluoromethyl, alkoxy, hydroxy, alkylthio, alkylamino, alkanoylamino, arylcarbonylamino, nitro, cyano, thiol, aryl, alkyl-aryl, haloaryl, cycloalkyl or alkylcycloalkyl;

the term aryl by itself or as part of another group contains 6 to 10 carbons and is unsubstituted or substituted with 1 or 2 lower alkyl groups, 1 or 2 halogens, 1 or 2 hydroxyl groups, 1 or 2 alkylamino groups, 1 or 2 alkanoylamino groups, 1 or 2 arylcarbonyl groups, 1 or 2 amino groups, 1 or 2 nitro groups, 1 or 2 cyano groups, 1 or 2 thiol groups, 1 or 2 alkylthio groups, and/or 1 or 2 lower alkoxy groups; and

the term cycloalkyl by itself or as part of another group contains 3 to 12 carbons and is unsubstituted or substituted with 1 or 2 halogens, 1 or 2 lower alkyl groups, 1 or 2 hydroxyl groups, 1 or 2 alkylamino groups, 1 or 2 alkanoylamino groups, 1 or 2 arylcarbonylamino groups, 1 or 2 amino groups, 1 or 2 nitro groups, 1 or 2 cyano groups, 1 or 2 thiol groups, 1 or 2 alkylthio groups, and/or 1 or 2 lower alkoxy groups; and

$(CH_2)_m$ can contain one or more lower alkyl and/or halogen substituents.

15. A method of inhibiting platelet aggregation and bronchoconstriction, which comprises administering to the circulatory system of a mammalian host an effective amount of a compound as defined in claim 1 or a pharmaceutically acceptable salt thereof.

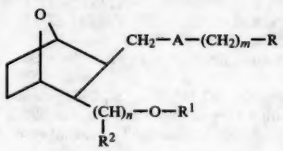
4,588,743

7-OXABICYCLOHEPTANE-SUBSTITUTED OXA PROSTAGLANDIN ANALOGS AND THEIR USE IN THE TREATMENT OF THROMBOLYTIC DISEASE

Martin F. Haslanger, Lambertville; Ravi K. Varma, Belle Mead, and Steven E. Hall, Ewing Township, Mercer County, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jan. 22, 1985, Ser. No. 693,647
Int. Cl.[4] A61K *31/34;* **C07D** *307/00*
U.S. Cl. 514—469 **25 Claims**

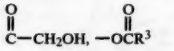
1. A compound having the structural formula



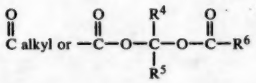
and including all stereoisomers thereof, wherein A is —CH=CH— or —$(CH_2)_2$—;

m is 1 to 8; n is 1 to 4;

R is OH,



(wherein R^3 is lower alkyl, aryl, arylalkyl or lower alkylamino),



(wherein R^4 and R^5 may be the same or different and are H, alkyl, aryl or arylalkyl and R^6 is alkyl, O-alkyl or aryl); R^1 is lower alkyl, aryl, aralkyl, cycloalkyl or cycloalkylalkyl; and R^2 is H or lower alkyl, but where R^2 is lower alkyl, n is 1, wherein the term lower alkyl or alkyl by itself or as part of another group contains 1 to 12 carbons and is unsubstituted or substituted with halo, trifluoromethyl, alkoxy, alkylthio, alkylamino, haloaryl, cycloalkyl or alkylcycloalkyl;

the term aryl by itself or as part of another group contains 6 to 10 carbons and is unsubstituted or substituted with lower alkyl, halogen or lower alkoxy;

the term cycloalkyl by itself or as part of another group contains 3 to 12 carbons and is unsubstituted or substituted with 1 or 2 halogens, 1 or 2 lower alkyl groups and/or 1 or 2 lower alkoxy groups; and

$(CH_2)_m$ can contain one or more lower alkyl substituents.

25. A method of inhibiting platelet aggregation, inhibiting bronchoconstriction, treating inflammation or relieving pain which comprises administering to a mammalian host an effective amount of a compound as defined in claim **1** or a pharmaceutically acceptable salt thereof.

4,588,744

METHOD OF FORMING AN AQUEOUS SOLUTION OF 3-3-BIS(P-HYDROXYPHENYL)-PHTHALIDE

John E. McHugh, 11633 S. Hawthorne Blvd., Hawthorne, Calif. 90250

Continuation-in-part of Ser. No. 943,811, Sep. 19, 1978, Pat. No. 4,256,763. This application Jan. 27, 1981, Ser. No. 228,987

Int. Cl.⁴ A61K *31/19, 31/34*

U.S. Cl. 514—470 **1 Claim**

1. The method of forming an aqueous solution of 3,3-Bis(p-hydroxyphenyl)-phthalide, suitable for treating mammals afflicted with the condition, disease, or symptom of inflammatory viral infection, cold sores, sun blisters, canker sores, actinic dermatitis, actinic keratosis, dermatitis, and acne comprising:

(a) making a mixture of 3,3-Bis(p-hydroxyphenyl)-phthalide and sodium bicarbonate;

(b) adding water to the mixture to yield a paste;

(c) heating the paste to less than the boiling point of water for a time sufficient to evaporate substantially all water, forming a substantially dry mixture; and

(d) dissolving the mixture in water.

4,588,745

TREATMENT OF VEGETABLE OILS

Terry R. Bessler, Decatur, Ill., assignor to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed Apr. 17, 1984, Ser. No. 601,189

Int. Cl.⁴ A61K *31/23*

U.S. Cl. 514—552 **7 Claims**

1. A process for preparing an injectable vegetable oil selected from the group consisting of soybean oil and sunflower oil and mixtures thereof which comprise:

(a) first treating the vegetable oil at a temperature of 80° C. to about 130° C. with an acid clay;

(b) deodorizing the vegetable oil with steam at a temperature of 220° C. to about 280° C. and applying a vacuum to remove volatilized components;

(c) treating the deodorized vegetable oil, at a temperature of from about 10° C. to about 60° C., with an acid clay to reduce the content of a member selected from the group consisting of diglycerides, tocopherol components, and trilinolenin and mixtures thereof, wherein said acid clay is added in a weight ratio to said deodorized vegetable oil of from about 1:99 to about 1:1; and

(d) thereafter conducting a particulate filtration to remove a substantial portion of the acid clay from the vegetable oil, wherein said filtration is accomplished with filters having a pore size of from about 0.1 to 0.45 microns,

thereby obtaining the injectable oil.

4,588,746

PROPYLAMINE DERIVATIVES

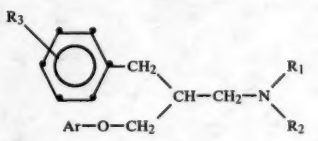
Jeffrey W. H. Watthey, Chappaqua, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 415,000, Sep. 7, 1982, abandoned. This application Jan. 4, 1984, Ser. No. 568,000

Int. Cl.⁴ A61K *31/185*

U.S. Cl. 514—554 **7 Claims**

1. A compound having the formula



(IA)

wherein R_1 represents hydrogen or methyl; R_2 represents methyl; R_3 represents hydrogen; and Ar represents 4-trifluoromethylphenyl; or a pharmaceutically acceptable salt thereof.

6. A method of treating mammals suffering from depression which comprises administering to said mammal in need thereof an effective amount of a serotonin uptake inhibiting compound of claim **1** in combination with one or more pharmaceutical carriers.

4,588,747

1,2,3,4-TETRAHYDRONAPHTHALENE DERIVATIVES USED AS ANTIGLAUCOMA AGENTS

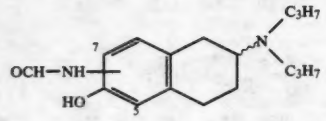
Icilio Cavero, Creteil, and Salomon Z. Langer, Paris, both of France, assignors to Synthelabo, Paris, France

Continuation-in-part of Ser. No. 644,704, Aug. 27, 1984, abandoned. This application Aug. 29, 1985, Ser. No. 770,758

Int. Cl.⁴ A61K *31/16*

U.S. Cl. 514—630 **5 Claims**

1. A method of treating glaucoma in a patient, which comprises topically administering to said patient an amount effective to reduce intraocular pressure of a compound of formula I



(I)

wherein the formylamino group is in the 5- or 7-position, and said compound is in the form of the racemate or one of the enantiomers thereof,

or a pharmaceutically acceptable salt thereof.

4,588,748

THERAPEUTICALLY USEFUL BENZYLIDENE DERIVATIVES

Jean-Pierre Kaplan, Bourg-La-Reine, France, assignor to Synthelabo, Paris, France

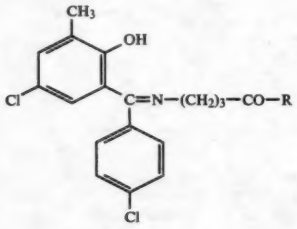
Continuation of Ser. No. 442,020, Nov. 16, 1982, abandoned. This application Sep. 25, 1984, Ser. No. 654,068

Claims priority, application France, Nov. 18, 1981, 81 21559

Int. Cl.⁴ C07C *103/29;* A61K *31/165*

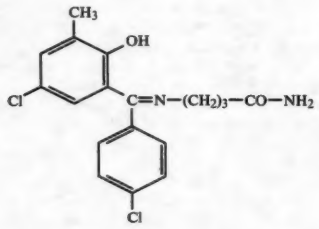
U.S. Cl. 514—641 **5 Claims**

1. A compound of the formula:



wherein R represents $—NH_2$, —OH or the group —OM in which M is an alkali metal or alkaline earth metal.

5. A method of providing to a subject an anticonvulsive-effect which comprises orally administering to said subject an anticonvulsant effective amount of a compound of the formula



4,588,749

ARYLETHANOLAMINE DERIVATIVES, THEIR PREPARATION AND USE IN PHARMACEUTICAL COMPOSITIONS

Michael J. Ferris, Sutton, England, assignor to Beecham Group p.l.c., England

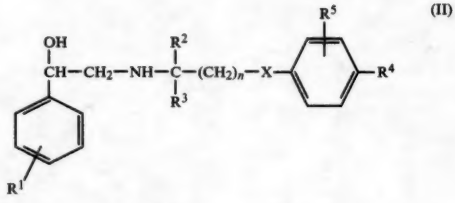
Continuation of Ser. No. 257,480, Apr. 23, 1981, abandoned. This application May 3, 1984, Ser. No. 606,597

Claims priority, application United Kingdom, May 8, 1980, 8015297

Int. Cl.⁴ A61K *31/135;* C07C *91/02*

U.S. Cl. 514—649 **12 Claims**

1. A compound of formula (II):



(II)

or a pharmaceutically acceptable salt thereof, in which X is a bond, R^1 is in the meta position in the phenyl ring and is a hydrogen, fluorine, chlorine or bromine atom or a trifluoromethyl or C_{1-4} alkyl group, each of R^2 and R^3 is a hydrogen atom or a C_{1-4} alkyl group, R^4 is a C_{1-4} alkyl group, R^5 is a hydrogen atom or a C_{1-4} alkyl group and n is an integer of from 1 to 3.

6. A pharmaceutical composition having anti-obesity and hypoglycaemic activity comprising an anti-obesity and hypoglycaemic amount of a compound to formula (II) as defined in claim 1 together with a pharmaceutically acceptable carrier.

4,588,750

THERAPEUTIC COMPOSITIONS FOR REDUCING SEBUM SECRETION

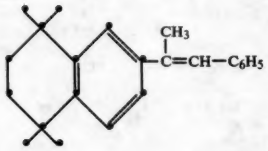
Alfred Boris, Parsippany-Troy Hills, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 394,754, Jul. 2, 1982, abandoned. This application Apr. 25, 1983, Ser. No. 488,318

Int. Cl.⁴ A61K *31/015*

U.S. Cl. 514—765 **26 Claims**

1. A method for reducing sebum secretion which comprises the administration to patients of a composition containing a present in an amount effective for reducing sebum secretion, said compound being represented by the following structural formula:



4,588,751

ANTI-LUMPING STYRENE POLYMER PARTICLES FOR MOLDING FOAMS

Alvin R. Ingram, West Chester, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Oct. 25, 1985, Ser. No. 791,478

Int. Cl.⁴ C08J *9/36*

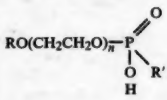
U.S. Cl. 521—57 **5 Claims**

1. Method of making foamable styrene polymer particles

which yield non-stratifying and antilumping foamed particles on pre-expansion comprising intimately mixing a dry blend of

(a) styrene polymer particles containing 3 to 20 weight percent of a blowing agent, and

(b) 0.01 to 0.04 weight percent of a mixture of phosphate esters having general formula



wherein R may be alkaryl groups, branched alkyl groups having at least 7 carbon atoms, or normal alkyl groups having at least 10 carbon atoms; n may be a positve integer of from 1 to 33; and R′ may be $RO(CH_2CH_2O)_n$— or hydroxyl group.

4,588,752

FOAMING AND VULCANIZING OF ELASTOMERIC POLYMERS

Chester J. Kmiec, Amherst, and Michael F. Novits, Buffalo, both of N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Sep. 30, 1985, Ser. No. 781,833

Int. Cl.[4] C08J *9/10*

U.S. Cl. 521—82 **9 Claims**

1. A foamable and vulcanizable composition comprising an admixture of a vulcanizable elastomeric polymer and a gas-generating system consisting essentially of a t-alkylhydrazinium salt and/or carbonylhydrazine and sulfur and/or sulfur donor compounds, and at least one sulfur accelerator.

4,588,753

PLASTICS CELLULAR MATERIAL

Alexander Miutel, 2007 Bloor St. West, Toronto, Ontario M6S 1M5, and Jerry P. Shira, both of Toronto, Canada

Division of Ser. No. 581,590, Feb. 21, 1984, Pat. No. 4,482,649. This application Oct. 29, 1984, Ser. No. 665,993

Int. Cl.[4] C08J *9/06*

U.S. Cl. 521—86 **6 Claims**

1. A plastics cellular material comprising the reaction of an unsaturated polyester resin containing a polymerizable unsaturated monomer and an epoxy-based vinyl ester in the presence of surfactants.

4,588,754

LOW MODULUS STRUCTURAL FOAM

Nan-I Liu, Mt. Vernon, Ind., assignor to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 567,987, Jan. 4, 1984. This application Oct. 3, 1985, Ser. No. 783,974

Int. Cl.[4] C08J *9/08*

U.S. Cl. 521—92 **15 Claims**

1. A formable low-modulus thermoplastic composition which comprises:

(a) a low-modulus poletherester copolymer wherein the ether linkage are present as high molecular weight polyalkylene ether units derived from long chaim polyalkylene ether glycols, and

(b) an effective amount of a chemical blowing agent selected from the group consisting of citric acid, and a mixture of citric acid and sodium bicarbonate, sufficient to achieved the desired weight reduction in the resultant foamed composition.

4,588,755

PROCESS FOR THE PREPARATION OF FLEXIBLE POLYESTER URETHANE FOAMS

Hans-Joachim Kollmeier, and Hans-Heinrich Schloens, both of Essen, Fed. Rep. of Germany, assignors to Th. Goldschmidt AG, Essen, Fed. Rep. of Germany

Filed Feb. 21, 1985, Ser. No. 703,736

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1984, 3406188

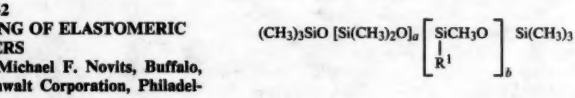
Int. Cl.[4] C08G *18/14, 18/20*

U.S. Cl. 521—112 **11 Claims**

1. In a process for the preparation of flexible polyester urethane foams by reacting polyester polyols having at least two hydroxyl groups in the molecule with at least difunctional polyisocyanates in the presence of water and a catalyst, the improvement comprising employing as said catalyst a mixture of

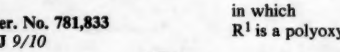
(a) 0.2 to 1.5 weight percent of N,N′-dimethylpiperazine; and

(b) 0.05 to 0.5 weight percent of a polysiloxane-polyoxyalkylene block copolymer of the general formula



in which

R^1 is a polyoxyalkylene radical of the general formula



in which

R^2 is an alkyl radical with 1 to 4 carbon atoms;

m=2 or 3, the average value of m being 2 to 2.5;

n=a whole number corresponding to a molecular weight for the R^1 radical of 250 to 1600;

a=is a whole number from 3 to 12; and

b=is a whole number from 3 to 12;

wherein the amounts in the mixture are based on the polyester polyol.

3. The process of claim 1 or 2 wherein the reaction mixture further contains a nonionic, water-soluble emulsifier in an amount of 50 to 200 weight percent, based on the mixture of N,N′-dimethylpiperazine and block copolymer.

4,588,756

MULTI-STEP METHOD FOR OBTAINING STRONG ADHESIVE BONDING OF COMPOSITES TO DENTIN, ENAMEL AND OTHER SUBSTRATES

Rafael L. Bowen, Gaithersburg, Md., assignor to American Dental Association Health Foundation, Washington, D.C.

Continuation-in-part of Ser. No. 516,956, Jul. 25, 1983, Pat. No. 4,521,550, which is a continuation-in-part of Ser. No. 457,029, Jan. 10, 1983, Pat. No. 4,514,527. This application Feb. 7, 1985, Ser. No. 699,079

Int. Cl.[4] A61K *6/00*

U.S. Cl. 523—116 **32 Claims**

1. A method for preparing the surface of dentin or enamel for adhesion of composite materials or resins, which method comprises:

(a) contacting with the surface of the dentin or enamel an aqueous solution or solutions comprising (1) at least on acidic salt containing a polyvalent cation which is capable of changing valence by unit steps and which can bind to dentin or enamel surface sites, and at least one anion which forms a relatively water-insoluble precipitate or precipitates with calcium and which contains at least one carboxyl group; and (2) acid;

(b) contacting with the surface of the dentin or enamel a solution comprising at least one compound selected from the group consisting of (1) N-phenylglycine, (2) the adduct of N(p-tolyl)gylcine and glycidyl methacrylate, and

(3) the addition reaction product of N-phenylglycine and glycidyl methacrylate in a solvent; and

(c) contacting with the surface of the dentin or enamel a solution comprising at least one compound selected from the group consisting of (1) the addition reaction product of pyromellitic acid dianhydride and 2-hydroxyethyl methacrylate, (2) the addition reaction product of 3,3',4,4'-benzophenonetetracarboxylic dianhydride and 2-hydroxyethyl methacrylate, and (3) 4-methacryloxyethyltrimellitic anhydride.

25. An article of manufacture comprising in combination:

(a) a first closed compartment containing a composition comprising (1) at least one acidic salt containing a polyvalent cation which is capable of changing valence by unit steps and which can bind to dentin or enamel surface sites, and at least one anion which forms a relatively water-insoluble precipitate or precipitates with calcium and which contains at least one carboxyl group; and (2) acid;

(b) a second closed compartment containing a composition comprising at least one compound selected from the group consisting of (1) N-phenylglycine, (2) the adduct of N(p-tolyl)glycine and glycidyl methacrylate, and (3) the addition reaction product of N-phenylglycine and glycidyl methacrylate; and

(c) a third closed compartment containing a composition comprising at least one compound selected from the group consisting of (1) the addition reaction product of pyromellitic acid dianhydride and 2-hydroxyethyl methacrylate, (2) the addition reaction product of 3,3',4,4'-benzophenonetetracarboxylic dianhydride and 2-hydroxyethyl methacrylate, and (3) 4-methacryloxyethyltrimellitic anhydride.

4,588,757

AQUEOUS EMULSION LAMINATING ADHESIVE

Ralph L. Minnis, Des Plaines; Elias P. Moschovis, Morton Grove, and James J. Killeen, Mundelein, all of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Feb. 11, 1985, Ser. No. 700,536

Int. Cl.[4] C08L *63/02;* **C09D** *3/58;* **C09J** *3/14, 3/16*

U.S. Cl. 523—406 **16 Claims**

1. A method of forming an aqueous emulsion adhesive comprising polymerizing monoethylenically unsaturated monomers in aqueous emulsion in the presence of an emulsified epoxy resin to form an aqueous emulsion copolymer, the copolymer of said monoethylenically unsaturated monomers having a glass transition temperature in the range of about −10° C. to about −50° C. and said epoxy resin being present in an amount of from about 2% to about 60%, based on the weight of the monomers which are copolymerized, and then mixing the aqueous emulsion of copolymer and epoxy resin formed by said copolymerization with an aqueous emulsion of amine-functional resin in an amount to supply a weight ratio of amino hydrogen atoms to oxirane groups of from about 0.1 to about 1.0.

4,588,758

TIRE SEALANT COMPOSITION

Lawrence E. Jaspon, 643 Barbour Island, Clearwater, Fla. 33515

Filed Mar. 13, 1985, Ser. No. 711,520

Int. Cl.[4] C08K *3/10, 5/01, 7/12;* **C08L** *33/02*

U.S. Cl. 523—166 **10 Claims**

1. A tire sealant composition for injection into pneumatic tires, comprising:

about 1 oz. (by weight) of sodium polyacrylate;

about 37 oz. (by weight) of asbestos fibers;

about 300 oz. (by weight) of ethylene glycol;

about 8 oz. (by weight) hydrocarbon process oil;

about 5 oz. (by weight) of detergent as a wetting agent and emulsifier;

about 27 oz. (by weight) of sodium bicarbonate; and

together with sufficient water to yield about 4.5 gallons (imperial measure) of final product.

8. A process for manufacturing a tire sealant composition to be injected into pneumatic tires, comprising the steps of;

(a) mixing water and ethylene glycol together in a mixing vat or drum;

(b) starting the continuous mixing action of the vat or drum;

(c) adding sodium bicarbonate to the continuously mixing mixture;

(d) adding asbestos fiber to the continuously mixing mixture;

(e) adding hydrocarbon process oil to the continuously mixing mixture;

(f) adding detergent to the continuously mixing mixture;

(g) testing the pH of the continuously mixing mixture and adjusting the pH to about 8.0 or 9.0 by the addition of suitable buffers or acidifiers, as necessary;

(h) pre-mixing the thickener and binding agent sodium polyacrylate with water;

(i) adding the pre-mix of step (h) to the continuously mixing mixture; and

(j) continuing the mixing action of the vat or drum until the composition is thoroughly mixed.

4,588,759

AQUEOUS COATING COMPOSITION AND PREPARATION THEREOF

Toshiharu Nakaya, Kyoto; Akimitsu Uenaka, Hyogo, and Takanobu Ueda, Hirakata, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Jun. 18, 1984, Ser. No. 622,062

Claims priority, application Japan, Jun. 18, 1983, 58-109610

Int. Cl.[4] C08L *63/00*

U.S. Cl. 523—414 **21 Claims**

1. An aqueous coating composition comprising water insoluble resinous powder (I), base neutralization aqueous resin (II) and pigment and wherein said water insoluble resinous powder is composed of polymer obtained by reacting a mixture of an epoxy resin and a resin having an epoxy reactive functional group, or a resin having both epoxy groups and epoxy reactive functional groups, with an amine in an amount which is sufficient enough to cause ring-opening of 10 to 50% of the total epoxy groups contained.

4,588,760

HAIR TREATMENT COMPOSITION

Janusz Jachowicz, and Leszek J. Wolfram, both of Stamford, Conn., assignors to Clairol Incorporated, New York, N.Y.

Filed Aug. 9, 1985, Ser. No. 764,025

Int. Cl.[4] A45D *7/04;* **A61K** *7/09;* **C08G** *14/06*

U.S. Cl. 524—12 **14 Claims**

1. A composition for decreasing hair hygroscopicity and thus imparting improved settability to keratin fibers, which comprises an aqueous solution containing a sufficient amount of heximinium salt and a sufficient amount of a resorcinol to form in situ in the keratin fibers a keratin fiber setting amount of a condensation polymer derived from said heximinium salt and said resorcinol.

4,588,761

COATING COMPOSITIONS CONTAINING SOLVENTS AND CROSSLINKING AGENTS AND THEIR USE FOR HEAT-ACTIVATED ONE-COAT REVERSE COATING

Wilhelm Thoma, Leverkusen; Josef Pedain, Cologne; Walter Schröer, Leverkusen, and Waldemar Kling, Kuerten, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 11, 1984, Ser. No. 599,027

Claims priority, application Fed. Rep. of Germany, Apr. 13, 1983, 3313236

Int. Cl.[4] C08L *1/10, 1/14, 75/06, 75/08*

U.S. Cl. 524—38 **4 Claims**

1. A polyurethane coating composition having a solids con-

tent of from about 20 to 60% by weight in at least one organic solvent wherein the solids comprise:

(I) from about 60 to 97.5 parts, based on I, of a polyurethane mixture of

(A) from about 60 to 90% by weight, based on I, of a relatively soft, substantially linear polyurethane of moderately high molecular weight based on

(a) hydroxy polyesters and/or polyethers having a molecular weight of about 600 to 6000,

(b) from 0 to about 1.5 moles, based on (a), of a chain-extending agent comprising a member selected from the group consisting of dialcohols, amino-alcohols, diamines, hydrazine hydrate, dihydrazide compounds and mixtures thereof, and

(c) aromatic and/or aliphatic polyisocyanates,

(B) from about 10 to 40% by weight, based on I, of a high molecular weight, relatively hard one-component polyurethane based on

(a) hydroxy polyesters and/or polyethers having a molecular weight of about 600 to 6000,

(b) from about 1.5 to 6 moles, based on (a), of a chain-extending agent selected from the group consisting of dialcohols, amino alcohols, diamines, hydrazine hydrate, dihydrazide compounds and mixtures thereof and

(c) aromatic and/or aliphatic polyisocyanates,

(II) from about 2.5 to 15 parts of a crosslinker combination of

(C) from about 10 to 60% by weight, based on II, of formaldehyde-urea and/or formaldehyde-melamine resins and

(D) from about 40 to 90% by weight of aliphatic and/or aromatic, unblocked or blocked polyisocyanates containing at least two isocyanate functions and

(III) said coating composition additionally containing

(E) from about 0.1 to 5 parts of cellulose acyl esters and mixed acyl alkyl esters,

(F) from about 0.3 to 3 parts of handle-improving agents,

(G) from 0 to about 5 parts of silicones and

(H) from 0 to about 20 parts of pigments, fillers and stabilizers.

4,588,762

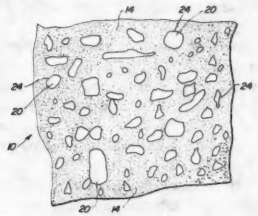
PRESSURE SENSITIVE ADHESIVE COMPOSITIONS FOR MEDICAL ELECTRODES

Norbert J. Mruk, Williamsville; Raymond C. Vaughan, Hamburg, and Arthur R. Eddy, Jr., Depew, all of N.Y., assignors to Graphic Controls Corporation, Buffalo, N.Y.

Continuation-in-part of Ser. No. 555,071, Nov. 25, 1983, Pat. No. 4,559,950. This application Nov. 20, 1984, Ser. No. 673,552

Int. Cl.[4] C07C *143/24, 143/56*

U.S. Cl. 524—45 **14 Claims**



1. An electrically-conductive, pressure-sensitive, adhesive which may be applied to a supporting substrate using conventional coating techniques,

said adhesive comprising a heterogeneous composition including,

viscoelastic polymeric phase for providing adhesive and coadhesive properties to said adhesive, and

an electrically conductive aqueous phase comprising,

water-receptive polymer means for absorbing moisture and deterring surface wetness on said adhesive, and for enhancing resistance of said adhesive to adverse effects of high relative humidity,

electrolyte means for imparting electrical conductivity to said adhesive, and

humectant means for entraining and retaining moisture in said adhesive to ensure and to enhance the conductivity of said adhesive within a broad range of ambient relative humidity conditions, for acting in combination with said electrolyte means for preventing high electrical impedance in said adhesive,

said viscoelastic polymeric phase and said aqueous phase being intimately interdispersed to provide a stable composition.

4,588,763

ETHYL ACETATE AS SOLVENT IN CAVITY LINERS

Martin Brännström, Lagårdsvägen 7, Saltsjö-Duvnäs, Sweden (S-130 11), and Hans Wahlstam, Dalkärrsleden 110, Vällingby, Sweden (S-162 24)

Filed Jun. 1, 1978, Ser. No. 911,480

Int. Cl.[4] C08L *93/00;* **A61C** *5/00*

U.S. Cl. 524—77 **5 Claims**

1. A dental cavity liner composition comprising a resin selected from the group consisting of polystyrene, polyacrylate, polymethacrylate and mixtures thereof, a non-toxic balsam, and a solvent consisting of ethyl acetate.

4,588,764

COMPOSITIONS OF POLYPHENYLENE ETHER RESIN AND DIPHOSPHITES

Gim F. Lee, Jr., Albany, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Filed Aug. 16, 1984, Ser. No. 641,573

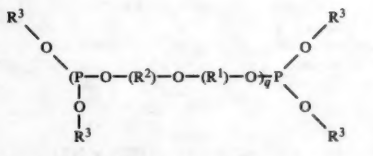
Int. Cl.[4] C08K *5/52;* **C08L** *71/04*

U.S. Cl. 524—128 **12 Claims**

1. A thermoplastic composition, comprising:

(a) a polyphenylene ether resin, alone, or in admixture with an alkenyl aromatic resin; and

(b) an amount of a diphosphite material having the formula



wherein R^1 and R^2 are independently C_1 to C_{10} alkylene; R^3 is aryl; and q represents the total number of dialkyleneglycol units and is an integer from 1 to 15, said amount of (b) being effective to reduce the initial yellowness index of (a).

4,588,765

IMPACT POLYAMIDE COMPOSITION CONTAINING GRAFTED NITROGEN COMPOUND

William H. Beever, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 24, 1984, Ser. No. 685,412

Int. Cl.[4] C08K *5/52*

U.S. Cl. 524—140 **19 Claims**

1. A thermoplastic composition comprising:

(a) a normally solid polyamide and

(b) an oil-soluble organonitrogen compound grafted hydrogenated conjugated diene/monovinylarene copolymer having a polymerized monovinylarene content of about 20 to 70 weight percent with the proviso that when said

copolymer contains a random block, the block polymonovinylarene content is in the range of 15 to 35 weight percent, the extent of hydrogenation of said copolymer being such that about at least 95 weight percent of olefinic double bonds have been saturated and less than about 5 weight percent of aromatic double bonds have been saturated, said copolymer characterized as having been prepared by the process which comprises metalating a hydrogenated conjugated diene hydrocarbon/monovinylarene hydrocarbon copolymer, and reacting the resulting metalated hydrogenated copolymer with effective amounts of at least one nitrogen-containing organic compound represented by the general formula $X—Q—(NR_2^3)_n$ or $Y[Q—(NR_2^3)_n]_m$ wherein each R_2^3 is the same or different alkyl, cycloalkyl, aryl, or combination thereof, Q is a hydrocarbon radical having a valence of nand is a saturated aliphatic, saturated cycloaliphatic, aromatic or combination radical, X is a functional group capable of reaction on a one-to-one basis with one equivalent of polymer lithium, n is at least one, and m is 2 or 3, thereby preparing said grafted copolymer,

said polymer of (b) being present in an amount within the range of (1) 15 to 50 weight percent based on the total weight of composition if used alone, or (2) if the polymer of (b) is used in combination with another hydrogenated conjugated diene/monovinylarene copolymer of the same type as that of (b) except for no organo-nitrogen compound being grafted thereto, the amount of the resulting combination is within the range of 20 to 50 weight percent based on the total weight of said composition, provided further that the amount of grafted copolymer when the polymers are used in combination times the weight percentage of nitrogen content equals at least 0.01 weight percent nitrogen based on the total weight of said thermoplastic composition.

4,588,766

ADHESION OF RUBBER TO METALS

Philip E. R. Tate, Stockport, England, assignor to Manchem Limited, Manchesster, England

Filed Jan. 7, 1985, Ser. No. 689,191

Claims priority, application United Kingdom, Jan. 10, 1984, 8400572

Int. Cl.[4] C08K *3/10;* **C08J** *3/20;* **C07F** *15/04, 15/06*

U.S. Cl. 524—176 **14 Claims**

1. A rubber adhesion promoter consisting essentially of the reaction product of an alkaline earth borate and a cobalt or nickel carboxylate.

4,588,767

HOT-MELT ADHESIVES BASED ON VINYL POLYMER AND PROCESS FOR ADHERING SURFACES THEREWITH

Jules E. Schoenberg, Scotch Plains; Thomas P. Flanagan, Green Brook, and Dilip K. Ray-Chaudhuri, Bridgewater, all of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Continuation-in-part of Ser. No. 284,162, Jul. 17, 1981, Pat. No. 4,535,140. This application May 24, 1985, Ser. No. 737,647

Int. Cl.[4] C08F *210/14;* **C09J** *00/00*

U.S. Cl. 524—272 **12 Claims**

1. A hot-melt adhesive comprising from 45–95% by weight of a vinyl polymer comprising:

(a) 40–90% by weight of a C_1–C_{12} alkyl acrylate, and 10–60% by weight of an alpha-olefin of C_{20}–C_{40},

wherein said alkyl acrylate is partially replaced with up to 60% by weight, based on the polymer, of vinyl acetate or with up to 10% by weight, based on the polymer, of a C_6–C_{12} olefin or with a mixture of vinyl acetate and C_6–C_{12} olefin, provided that the polymer in all instances contains at least 10% by weight of said alkyl acrylate, and

(b) 5–25% by weight of a tackifying resin, and

(c) 0–30% by weight of a modifying component.

4,588,768

THERMALLY CONDUCTIVE HEAT CURABLE ORGANOPOLYSILOXANE COMPOSITIONS

Marie J. Streusand, Saline, Mich., assignor to SWS Silicones Corporation, Adrian, Mich.

Filed Oct. 29, 1984, Ser. No. 665,576

Int. Cl.[4] C08K *3/34*

U.S. Cl. 524—443 **9 Claims**

1. A thermally conductive heat curable organopolysiloxane composition comprising an organopolysiloxane having recurring units of the formula

$$R_nSiO_{\frac{4-n}{2}}$$

where R is selected from the group consisting of monovalent hydrocarbon radicals and halogenated monovalent hydrocarbon radicals having from 1 to 18 carbon atoms and n is a number of from 1.7 to 2.2, an organic peroxide vulcanizing agent and from 30 to 95 percent by weight of filler based on the weight of the composition, of which from about 30 to 100 percent by weight based on the weight of the filler is silicon nitride particles.

4,588,769

MULTIPURPOSE FIRE RESISTANT SEALING AND CAULKING COMPOUND

Olavi E. Vehmas, Bridgewater; Bernard L. Kotyuk, Manville, both of N.J., and John M. Pallo, Englewood, Colo., assignors to Manville Sales Corporation, Denver, Colo.

Filed Jan. 31, 1985, Ser. No. 696,957

Int. Cl.[4] C09D *5/18, 5/34*

U.S. Cl. 524—448 **10 Claims**

1. A composition suitable as a multipurpose sealing and caulking material having a fire resistance rating of V0 as measured by UL 94 test procedure comprising in weight percent the following ingredients;

(a) 45–60 wt.% of at least one inorganic filler;

(b) 12–30 wt.% of at least one ceramic fiber;

(c) 0.1–0.5 wt.% of at least one reinforcing agent selected from the group consisting of organic fibers and polyolefin pulps;

(d) 18–30 wt.% of at least one chlorinated paraffin tackifying agent; and

(e) 2–5 wt.% of at least one oleoresinous oil.

9. A composition suitable as a multipurpose sealing and caulking material having a fire resistance rating of V0 as measured by UL 94 test procedure consisting essentially in weight percent of the following ingredients:

(a) about 52.4 wt.% talc;

(b) about 18.0 wt.% mineral wool;

(c) about 2.0 wt.% diatomite;

(d) about 0.1 wt.% polyester fiber;

(e) about 0.3 wt.% of a polypropylene pulp;

(f) about 24.0 wt.% of a chlorinated paraffin; and

(g) about 3.2 wt.% of an oleoresinous oil.

4,588,770

POLYORGANOSILOXANE COMPOSITIONS WHICH HARDEN INTO ELASTOMERS AT ROOM TEMPERATURE

Thomas Würminghausen, Leverkusen; Franz Saykowski, Cologne, and Hans Sattlegger, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 21, 1984, Ser. No. 622,946

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1983, 3323911

Int. Cl.⁴ C08L *83/04;* **C08K** *3/36, 5/54, 3/10*

U.S. Cl. 524—731 **9 Claims**

1. A room temperature hardenable polyorganosiloxane composition comprising a polyorganosiloxane containing reactive end groups, a polyester wherein the number of hydroxyl groups of said polyester have been reduced by carboxylation, urethanation, etherfication and/or silylation, and a thickening filler.

4,588,771

STABILIZED THIOFUNCTIONAL POLYSILOXANE FLUIDS AND A PROCESS FOR STABILIZING THE SAME

Paul A. Manis, Allentown, Pa.; Eugene R. Martin, Onsted, and Ronald L. Muntz, Adrian, both of Mich., assignors to SWS Silicones Corporation, Adrian, Mich.

Filed Apr. 10, 1985, Ser. No. 721,822

Int. Cl.⁴ C08K *5/24*

U.S. Cl. 524—731 **26 Claims**

1. A stable thiofunctional polysiloxane fluid comprising a thiofunctional polysiloxane fluid having units of the formula

$$(R'SR''-)_b\overset{R_a}{\overset{|}{Si}}O_{\frac{4-(a+b)}{2}}$$

where R is selected from the group consisting of a monovalent hydrocarbon radical having from 1 to 18 carbon atoms and a halogenated monovalent hydrocarbon radical having from 1 to 18 carbon atoms, R' is selected from the group consisting of hydrogen and a monovalent hydrocarbon radical having from 1 to 18 carbon atoms, R'' is selected from the group consisting of a divalent hydrocarbon radical free of aliphatic unsaturation having from 2 to 18 carbon atoms, a hydrocarbonoxy radical and a hydrocarbon thioether radical in which R'' is bonded to the silicon atom via a silicon-carbon bond, a is a number of from 0 to 2, b is a number of from 1 to 3 and the sum of a+b is equal to at least 2 and from 0.001 to 5 percent by weight of an amine containing compound based on the weight of the thiofunctional polysiloxane fluid and the amine containing compound, in which the amine containing compound is selected from the group consisting of an organic amine, an aminofunctional silane and an aminofunctional siloxane.

4,588,772

WATER-SOLUBLE, POLYMER-MODIFIED HYDROXYALKYL METHYL CELLULOSE AND ITS USE AS AN ADDITIVE FOR ASBESTOS-FREE TILE ADHESIVE FORMULATIONS

Branislav Böhmer, Walsrode; Werner Lange, Visselhoevede, and Frank Höhl, Neuenkirchen, all of Fed. Rep. of Germany, assignors to Wolff Walsrode AG, Walsrode, Fed. Rep. of Germany

Filed Oct. 26, 1984, Ser. No. 664,906

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1983, 3339860

Int. Cl.⁴ C08B *37/00, 7/352, 7/354;* **C04B** *11/22*

U.S. Cl. 525—54.23 **5 Claims**

1. A water-soluble substance of high molecular weight obtained by reacting

(1) from 85 to 97% by weight of a hydroxy (C_2–C_3) alkyl methyl cellulose.

(2) from 3 to 15% by weight of a copolymer of

(a) from 30 to 75 mole percent of 2-acrylamido-2-methyl-3-propane sulfonic acid,

(b) from 15 to 35 mole percent of acrylamide and

(c) from 10 to 50 mole percent of ethylacrylate and

(3) from 0.2 to 1.2 moles per mole of component (2) of a bifunctional crosslinker component,

in an alkaline medium consisting of NaOH used in a total quantity of from 1.98 to 3.08 g of NaOH per 100 g of HAMC.

4,588,773

ANTISTATIC THERMOPLASTIC COMPOSITION

Alan R. Federl, and George P. Kipouras, both of Parkersburg, W. Va., assignors to Borg-Warner Chemicals, Inc., Parkersburg, W. Va.

Filed Dec. 21, 1984, Ser. No. 685,091

Int. Cl.⁴ C08L *55/02, 71/02, 71/00*

U.S. Cl. 525—64 **11 Claims**

1. An antistatic thermoplastic composition consisting essentially of:

(A) less than 80% by weight of an ABS graft copolymer consisting essentially of:

(i) at least 40% by weight of a vinyl aromatic compound and an acrylonitrile compound;

(ii) 60% or less by weight of a rubber substrate; and

(B) more than 20% by weight of an epihalohydrin copolymer.

4,588,774

THERMODYNAMICALLY MISCIBLE POLYMER COMPOSITIONS

Barry D. Dean, Broomall, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Mar. 6, 1985, Ser. No. 708,773

Int. Cl.⁴ C08L *55/02, 35/06, 33/12, 39/04*

U.S. Cl. 525—73 **16 Claims**

1. A polymer composition comprising (A) a terpolymer having from about 50 to about 90% by weight of a methylmethacrylate, from about 9 to about 35% by weight of an N-aryl substituted maleimide and from about 1 to about 15% by weight of a vinyl aromatic monomer and (B) a polymer selected from the group consisting of (1) a copolymer matrix of from about 65 to about 85% by weight of a vinyl aromatic monomer selected from the group consisting of styrene and α-methyl styrene and from about 15 to about 35% by weight acrylonitrile, and (2) a rubber grafted with a copolymer matrix of from about 65 to about 85% by weight of a vinyl aromatic monomer selected from the group consisting of styrene and α-methylstyrene, and from about 15 to about 35% by weight acrylonitrile, said rubber being employed in an amount within the range of from about 1 to about 40 parts per each 100 parts by weight of said vinyl aromatic monomer plus said acrylonitrile, wherein the weight ratio of component (A) to the copolymer matrix of component (B) is from 99:1 to 1:99; and wherein component (A) and the copolymer matrix of (B) are thermodynamically miscible with one another such that the polymer composition exhibits a single glass transition temperature value.

4,588,775

HIGH TOUGHNESS PROPYLENE POLYMER COMPOSITIONS

J. Douglas McCullough, Jr., Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jun. 22, 1984, Ser. No. 623,697

Int. Cl.⁴ C08L *53/00*

U.S. Cl. 525—88 **17 Claims**

1. A composition having a melt flow between about 0.5 and about 30 dg/min (ASTM D1238-Condition L), and a high notched impact value, said composition being obtained by

blending in the absence of a peroxide 50–96% by weight of an impact-improved propylene-ethylene copolymer, 2 to 45% by weight of a high density ethylene homopolymer, 2–45% by weight of a linear low density ethylene copolymer and 0 to 30% by weight of a rubber selected from the group consisting of ethylene-propylene rubber and ethylene-propylene-diene monomer rubber, wherein:

(a) said impact-improved propylene-ethylene copolymer has a melt flow (ASTM D1238-Condition L) of about 0.5 to 30 dg/min and an elastomeric propylene-ethylene copolymer content of 5–50% by weight, the copolymer fraction having an ethylene content of 30–95% by weight, which propylene-ethylene copolymer is the product of sequential polymerization of propylene and a propylene-ethylene mixture over a titanium halide-containing coordination catalyst;

(b) said high density ethylene homopolymer has a density in the range from 0.941 to 0.965 g/cc and a melt index (ASTM D1238 Cond. E) in the range from 0 to 20 dg/min;

(c) said linear low density ethylene copolymer is the product of polymerization of ethylene with up to 15 mole percent of at least one C_3–C_8 alpha olefin monomer over a transition metal-based coordination catalyst and which has a density in the range from 0.912 to 0.935 g/cc and a melt index (ASTM D 1238-Condition E) in the range from 0.1 to 16; and

(d) the weight ratio of high density ethylene homopolymer to linear low density ethylene copolymer is between 80:20 and 20:80.

4,588,776

POLYVINYL HALIDE POLYMER COMPOSITION AND SHAPED ARTICLES PRODUCED THEREFROM

Vladimir Bekker, St. Louis; Wayne J. Buchheim, Ballwin; William Vanderlinde, Creve Court, and Donald S. T. Wang, St. Louis, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 477,197, Mar. 21, 1983, abandoned. This application Jun. 29, 1984, Ser. No. 626,352

Int. Cl.[4] C08L *31/06*

U.S. Cl. 525—81 **11 Claims**

1. A polymer composition comprising a blend of a vinyl halide polymer and a particulate polymer, said particulate polymer having a molecular weight of at least about 100,000 and a glass transition temperature of between about 60° C. and 100° C. and comprising between about 30% and about 90% by weight of repeating units derived from an olefin, between about 1% and about 30% by weight of diester repeating units derived from a diester of an addition polymerizable unsaturated dicarboxylic acid, and between about 1% and about 40% by weight of repeating units derived from a solubilizing monomer selected from acrylonitrile and methacrylonitrile which promotes compatibility of the particulate polymer with said vinyl halide polymer.

4,588,777

SYNTHETIC RESIN COMPOSITION

Masahiro Hotta, Matsudo, Japan, assignor to Dainippon Plastics Co., Ltd., Osaka, Japan

Filed Oct. 21, 1983, Ser. No. 544,146

Claims priority, application Japan, Oct. 21, 1982, 57-185874

Int. Cl.[4] C08L *53/02*

U.S. Cl. 525—93 **8 Claims**

1. A synthetic resin composition comprising

(a) 40 to 80% by weight of a block copolymer whose both terminal blocks comprise a polymer of an aromatic vinyl compound and whose intermediate block comprises a polymer of conjugated diene series, said terminal blocks constituting 10 to 40% by weight of the copolymer and being hydrogenated in a ratio of 10% or less and said intermediate block constituting 90 to 60% by weight of the copolymer and being hydrogenated in a ratio of 90% or more;

(b) 10 to 30% by weight of an isotactic polypropylene or a copolymer comprising such isotactic polypropylene as its main component having a melting point of 150° C. or higher,and

(c) 10 to 30 % by weight of an ethylene-acrylate copolymer whose acrylate content is 5 w/w % or more.

4,588,778

TOUGHENING REINFORCED EPOXY COMPOSITES WITH BROMINATED POLYMERIC ADDITIVES

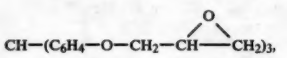
Zohar Nir, Beer Sheva, Israel, and William J. Gilwee, Jr., Los Altos, Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Division of Ser. No. 493,865, May 12, 1983, Pat. No. 4,550,129. This application Aug. 15, 1985, Ser. No. 765,980

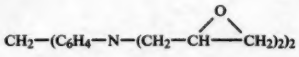
Int. Cl.[4] C08L *63/04, 63/10*

U.S. Cl. 525—115 **7 Claims**

1. An epoxy resin composition comprising a polyfunctional epoxy resin selected from the group consisting of TEN epoxy resin of formula:



TGDDM epoxy resin of formula:



and mixtures thereof admixed with a toughening amount of a brominated diglycidyl additive having an epoxy equivalence of from about 250 to about 1500 and a bromine content of about 50% by weight, said epoxy resin composition additionally comprising a pre-formed copolymer of said brominated digycidyl additive with carboxy-terminated butadiene acrylonitrile rubber.

4,588,779

MODIFIED POLYETHERIMIDE RESINS

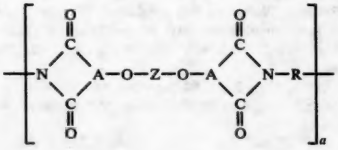
Robert W. Smearing, Pittsfield, Mass., assignor to General Electric Company, Pittsfield, Mass.

Filed Oct. 30, 1984, Ser. No. 666,325

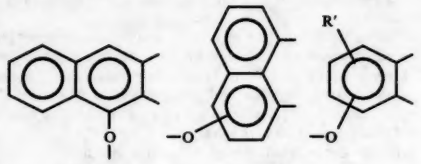
Int. Cl.[4] C08L *77/00*

U.S. Cl. 525—180 **9 Claims**

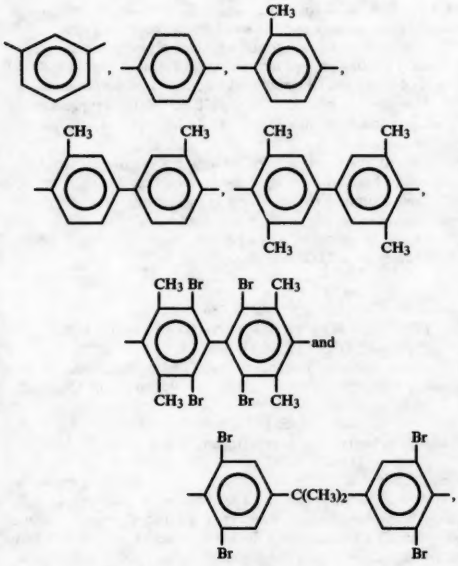
1. A composition comprising a blend of (a) a polyetherimide and (b) a high density polyethylene in an amount effective to raise the melt index of the polyetherimide wherein said polyetherimide is of the formula



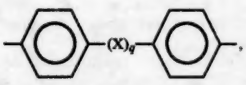
wherein a represents a whole number in excess of 1, the group —O—A< is selected from



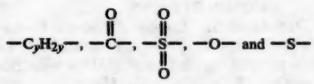
R' being hydrogen, lower alkyl or lower alkoxy, Z is a member of the class consisting of (1)



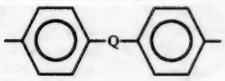
and (2) divalent organic radicals of the general formula:



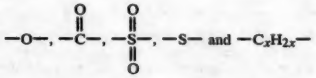
where X is a member selected from the class consisting of divalent radicals of the formulas,



where q is 0 or 1, y is a whole number from 1 to 5, and R is a divalent organic radical selected from the class consisting of (1) aromatic hydrocarbon radicals having from 6–20 carbon atoms and halogenated derivatives thereof, (2) alkylene radicals and cycloalkylene radicals having from 2–20 carbon atoms, $C_{(2-8)}$ alkylene terminated polydiorganosiloxane, and (3) divalent radicals included by the formula



where Q is a member selected from the class consisting of



where x is a whole number from 1 to 5 inclusive.

4,588,780

FIBRE CONTAINING POLYMERS AND PROCESS FOR PRODUCTION THEREOF

Douglas C. Edwards, and James A. Crossman, both of Sarnia, Canada, assignors to Polysar Limited, Sarnia, Canada

Continuation of Ser. No. 578,503, Feb. 9, 1984, abandoned. This application May 17, 1985, Ser. No. 735,294

Int. Cl.[4] C08L *77/10, 9/08, 9/04*

U.S. Cl. 525—184 **19 Claims**

1. A process for the production of mixtures of polymer and fibrous material, said process comprising the steps of providing an agitated aqueous solution of coagulant for the polymer, said coagulant being selected from the group consisting of calcium chloride, sulfuric acid plus sodium chloride, sulphuric acid plus sodium chloride plus polyamine compound, alum, and alum plus sulphuric acid, adding an aqueous suspension of said fibrous material to the coagulant solution, adding said polymer in aqueous latex form to said coagulant solution and co-coagulating said polymer and fibrous material, and recovering and drying the mixture of polymer and fibrous material, said fibrous material being a polymeric paraphenylene terephthalamide aramid having an average length of from about 1 to about 5 mm and a BET surface area of greater than 1 m^2/g.

4,588,781

FLUORINE-CONTAINING COPOLYMER AND COMPOSITION CONTAINING THE SAME

Akira Ohmori, Ibaraki; Nobuyuki Tomihashi, Takatsuki, and Yoshiki Shimizu, Settsu, all of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Division of Ser. No. 599,134, Apr. 11, 1984, Pat. No. 4,529,785. This application Apr. 12, 1985, Ser. No. 722,560

Claims priority, application Japan, Apr. 11, 1983, 58-63398; Apr. 11, 1983, 58-63399; Jul. 25, 1983, 58-136353

Int. Cl.[4] C08L *27/12*

U.S. Cl. 525—200 **3 Claims**

1. A composition suitable for forming which comprises

(1) a fluorine-containing copolymer comprising chlorotrifluoroethylene, 2,2,3,3-tetrafluoropropyl vinyl ether and a vinyl ether having a functional group selected from the group consisting of hydroxyl, glycidyl and amino, and

(2) a methyl methacrylate polymer comprising predominantly methyl methacrylate,

wherein the content of chlorotrifluoroethylene is from 40 to 60% by mole, the content of 2,2,3,3-tetrafluoropropyl vinyl ether is from 25 to 50% by mole, and the content of the vinyl ether having said functional group is from 0.5 to 25% by mole.

4,588,782

DIENE POLYMERS AND PROCESS FOR PRODUCING THE SAME

Hisao Ono; Fumio Tsutsumi; Mitsuhiko Sakakibara, all of Yokkaichi, and Eitaro Okuya, Mie, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed Jan. 11, 1985, Ser. No. 690,589
Claims priority, application Japan, Feb. 1, 1984, 59-15019
Int. Cl.[4] C08F *293/00*
U.S. Cl. 525—245 41 Claims

1. A diene polymer produced by polymerizing a conjugated diene monomer in an organic solvent solution of an active lithium-terminated polymer in the presence of a catalyst consisting of (A) a cobalt compound and (B) carbon disulfide or phenylisothiocyanic acid or a mixture thereof, said diene polymer comprising a 1,2-polybutadiene portion having a 1,2-configuration content of 70% or more.

4,588,783

AMIDE-CONTAINING POLYHYDROXYETHYL CARBAMATES

Wen-Hsuan Chang, Gibsonia, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 16, 1983, Ser. No. 562,318
Int. Cl.[4] C08F *8/30*
U.S. Cl. 525—329.9 7 Claims

1. A curable composition comprising:

(A) an amide-containing polyhydroxyethyl carbamate which is prepared by reacting:

(1) an amidoamine, and

(2) a cyclic organic carbonate, and

(B) an active hydrogen-containing material which is external or internal to the carbonate of (A) and is different therefrom comprising a hydroxyl group-containing polymer selected from the group consisting of an epoxy polymer, an acrylic polymer, a polyurethane polymer and a polyester polymer.

4,588,784

AROMATIC TITANATE MODIFIED NYLON MAGNET WIRE INSULATION COATING

Francois A. Lavallee, Fort Wayne, Ind., assignor to Essex Group, Inc., Fort Wayne, Ind.

Division of Ser. No. 660,359, Oct. 12, 1984. This application Jul. 25, 1985, Ser. No. 758,913
Int. Cl.[4] C08F *283/00*; C08L *67/00*
U.S. Cl. 525—419 2 Claims

1. A magnet wire enamel composition comprising nylon reacted with about 0.25% to 10% by weight of an aromatic titanate selected from the group consisting of $(RO)_4Ti$, dimers, trimers, and mixtures thereof where R is an aromatic group.

4,588,785

APPLICATION OF BLOCK COPOLYESTER AMIDES AS THERMOPLASTIC ADHESIVES FOR TEXTILES

Hanns-Jörg Bax, Marl; Gernot Horlbeck, Haltern; Rainer Feldmann, and Salih Mumcu, both of Marl, all of Fed. Rep. of Germany, assignors to Chemische Werke Hüls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Jul. 3, 1985, Ser. No. 751,446
Claims priority, application Fed. Rep. of Germany, Sep. 25, 1984, 3435053
Int. Cl.[4] C08F *283/00*; C08G *63/76, 69/48*; C08L *67/00*
U.S. Cl. 525—419 15 Claims

1. A method of applying powdered block copolyester amides having melting points between 80° and 135° C. and a solution viscosity J between 60 and 120 ml/gram measured at 25° C. in a 0.23% solution of 60 parts by weight phenol and 40 parts by weight of 1,1,2,2-tetrachloroethane as thermoplastic adhesives to textiles comprising:

(a) carrying out a polycondensation reaction of

(A) 60 to 95% by weight of a block polyester having terminal hydroxy groups containing as the acid part at least 50 molar percent of terephthalic acid and correspondingly as an alcohol part containing 40 to 90 mole percent of 1,4-butanediol and 60 to 10 molar percent of 1,6-hexanediol; and

(B) 40 to 5% by weight of a block polyamide dicarboxylic acid, obtained from omega-aminocarboxylic acids or lactams having 6 to 12 carbon atoms or mixtures of omega-aminocarboxylic acids and lactams and aromatic or aliphatic dicarboxylic acids having a mean molecular weight M_n between 1,000 and 8,000;

(b) grinding the polycondensation reaction product; and

(c) applying the powdered block copolyester amides as adhesives to textiles.

9. Powdered block copolyester amides having melting points between 80 and 135° C. and a solution viscosity J between 60 and 120 ml/gram measured at 25° C. in a 0.23 percent solution of 60 parts by weight of phenol and 40 parts by weight of 1,1,2,2-tetrachloroethane for application as thermoplastic adhesives to textiles and obtained by polycondensing:

(A) 60 to 95% by weight of a block polyester having terminal hydroxy groups containing as the acid part at least 50 molar percent of terephthalic acid and correspondingly as the alcohol part containing 40 to 90 molar percent of 1,4-butanediol and 60 to 10 molar percent of 1,6-hexanediol; and

(B) 40 to 5% by weight of a block polyamide dicarboxylic acid, obtained from omega-aminocarboxylic acids or lactams having 6 to 12 carbon atoms or mixtures of omega-aminocarboxylic acids and lactams and aromatic or aliphatic dicarboxylic acids having a mean molecular weight M_n between 1,000 and 8,000.

4,588,786

PROCESS FOR PRODUCING WATER-SOLUBLE DICARBOXYLIC ACID IMIDE COMPOUNDS

Hiromitsu Kadono, Yokohama, and Tadao Natsuume, Yokosuka, both of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Oct. 5, 1984, Ser. No. 658,417
Claims priority, application Japan, Oct. 6, 1983, 58-187490
Int. Cl.[4] C08F *22/02, 22/04, 22/06*
U.S. Cl. 525—327.6 10 Claims

1. A process for producing a water-soluble dicarboxylic acid imide compound which comprises adding a primary amine compound to an aqueous solution of a water-soluble salt of a dicarboxylic acid compound containing at least one dicarboxylic acid unit capable of forming a 5-membered cyclic acid imide linkage and heating the mixture at a temperature of above 100° C. and at a pH of 1 to 7 to introduce an acid imide linkage into the molecule.

3. The process of claim 1 wherein the dicarboxylic acid compound is a polymer of an alpha,beta-unsaturated dicarboxylic acid or its anhydride.

4. The process of claim 1 wherein the dicarboxylic acid compound is a copolymer of an alpha,beta-unsaturated dicarboxylic acid or its anhydride with another comonomer.

4,588,787

FLEXIBLE TWO COMPONENT URETHANE COATING COMPOSITIONS

Panagiotis I. Kordomenos, Mt. Clemens; Kenneth R. Kurple, Anchorville, and Delores J. Alexander, Southfield, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Oct. 13, 1983, Ser. No. 558,399
Int. Cl.[4] C08F *20/00*; C08L *75/06*
U.S. Cl. 525—440 15 Claims

1. A flexible two component urethane coating composition which is characterized in that it comprises:

(A) hydroxy-containing urethane modified polyester (i) having a number average molecular weight ($\bar{M}_n$) of between about 1000 and about 10,000, (ii) having a hydroxyl number of between about 30 and about 200, and (iii) con-

taining between about 1 and about 10 urethane groups per molecule, and being made from reactants comprising:

(1) urethane modified diol made by reacting:

(a) diol, and

(b) diisocyanate, wherein said diol and said diisocyanate are reacted in a molar ratio of from about 4:1 to about 4:3;

(2) polyol comprising at least about 5 weight percent triol; and

(3) acid component selected from dicarboxylic acids and anhydrides thereof;

(B) polyisocyanate crosslinking agent; and

(C) 0–60 weight percent, based on the total weight of (A) and (B) of said composition, of a linear polyurethane having a number average molecular weight of between about 15,000 and about 40,000.

4,588,788

REACTIVE DILUENTS FOR POLYEPOXIDES

William D. Emmons, Huntingdon Valley, and Charles E. Warburton, Jr., Ambler, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Apr. 26, 1985, Ser. No. 727,636

Int. Cl.[4] C08F *283/10*

U.S. Cl. 525—531 10 Claims

1. A curable coating or adhesive composition comprising (1) a blend of at least one polyepoxide and the esterification product of a mixture of ethylenically unsaturated carboxylic acids of the formula $CH_2{=}CHCO_2(CH_2CH_2CO_2)_nH$, where the number average value of n is greater than about 0.1, and at least one hydroxy-functional compound selected from mono- and polyhydric compounds, the ratio of acid to alcohol ranging from 10:1 to 1:10, on an equivalent basis, wherein the ratio of said esterification product to said polyepoxide is from about 5:100 to 1:1 by weight, and (2) an aliphatic amine curing agent containing at least three amine hydrogens per molecule, wherein the amount of said curing agent is such that there are about 0.75 to 1.25 amine hydrogen atoms for each epoxy group of said polyepoxide and for each unsaturated acryl group of said esterification product.

4,588,789

METHOD FOR THE CRYSTALLIZATION OF POLY(ARYLENE SULFIDE)

Lacey E. Scoggins, and Guy Senatore, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 559,136, Dec. 7, 1983, abandoned, which is a continuation-in-part of Ser. No. 416,209, Sep. 9, 1982, abandoned. This application Feb. 8, 1985, Ser. No. 699,694

Int. Cl.[4] C08F *283/00*

U.S. Cl. 525—537 24 Claims

1. A method for affecting the crystallization of poly(phenylene sulfide) comprising contacting poly(phenylene sulfide) with water soluble, mono- or polyvalent metal inorganic salt or hydroxide of alkali and alkaline earth metal elements of Group IA and IIA of the Periodic Table in solution at a temperature and for a time to provide metal cations in a residual concentration in the range of about 50 to about 5000 ppm in the composition with the polymer after the treatment thereby affecting the crystallization of the polymer by lowering the rate of crystallization and/or lowering the melt crystallization temperature.

4,588,790

METHOD FOR FLUIDIZED BED POLYMERIZATION

John M. Jenkins, III, So. Charleston, W. Va.; Russell L. Jones, Chapel Hill, N.C.; Thomas M. Jones, So. Charleston, W. Va., and Samil Beret, Danville, Calif., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 594,962, Apr. 3, 1984, Pat. No. 4,543,399, which is a continuation of Ser. No. 361,547, Mar. 24, 1982, abandoned. This application Aug. 24, 1984, Ser. No. 643,884

The portion of the term of this patent subsequent to Sep. 24, 2002, has been disclaimed.

Int. Cl.[4] C08F *2/34*

U.S. Cl. 526—70 33 Claims

1. In a continuous gas fluidized bed process for the production of polymer by continuously passing a gaseous stream comprising monomer through a fluidized bed in a reaction zone in the presence of catalyst under reactive conditions, withdrawing from said reaction zone polymer product and a stream comprising unreacted gases and solid particles, cooling said stream and recycling said cooled stream to said reaction zone together with sufficient additional monomer to replace monomer polymerized and withdrawn as polymer product, the improvement comprising cooling at least a part of said recycle stream to condense a portion thereof and form a liquid-containing mixture wherein the weight ratio of liquid to solid particles is not less than about two to one, and introducing said mixture into said reaction zone wherein the liquid in said mixture is vaporized.

4,588,791

PROCESS FOR THE PRODUCTION OF SUSPENSION POLYVINYL CHLORIDE SUITABLE FOR PROCESSING BY INJECTION MOLDING

Heimo Bieringer, Raesfeld-Erle; Martin Engler, and Wolfgang Holtrup, both of Marl, all of Fed. Rep. of Germany, assignors to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Sep. 7, 1984, Ser. No. 648,221

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1983, 3332376

Int. Cl.[4] C08F *2/28*

U.S. Cl. 526—78 13 Claims

1. In a process for the production of suspension polyvinyl chloride suitable for processing by injection molding, comprising suspension polymerizing vinyl chloride at at least two polymerization temperatures, subsequent temperature being higher than previous ones, in the presence of an oil-soluble catalyst, a suspension stabilizer, and a regulator, the improvement comprising adding 3–5% by weight based on vinyl chloride of the regulator, said regulator being added to the polymerization mixture in a single addition step, at a point in the polymerization reaction wherein the vinyl chloride conversion is 24 20% by weight and ≦70% by weight.

4,588,792

ELECTRICALLY CONDUCTIVE POLY(β-DIKETONE) AND PROCESS THEREFOR

Yoshiyuki Okamoto, Fort Lee, N.J., and Edward F. Hwang, Brooklyn, N.Y., assignors to W. R. Grace & Co., New York, N.Y.

Division of Ser. No. 579,406, Feb. 13, 1984. This application Jan. 11, 1985, Ser. No. 690,791

Int. Cl.[4] C08F *4/06*; H01B *1/06*

U.S. Cl. 526—90 2 Claims

1. A process for producing poly(β-diketone) which comprises reacting diketene in an organic solvent and an inert atmosphere in the presence of a catalytic amount of a WCl_6 catalyst at temperatures ranging from about minus 20° C. up to plus 30° C.

4,588,793

CATALYST COMPONENT FOR POLYMERIZATION OF OLEFINS

Masafumi Imai; Tadashi Yamamoto; Hiroyuki Furuhashi; Hiroshi Ueno, and Naomi Inaba, all of Saitama, Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 15, 1985, Ser. No. 765,763
Claims priority, application Japan, Aug. 30, 1983, 58-157094
Int. Cl.[4] C08F 4/64
U.S. Cl. 526—124 11 Claims

1. A process for the polymerization of olefins which comprises homopolymerizing an olefin copolymerizing ethylene with an alpha-olefin or copolymerizing at least two different alpha-olefins in the presence of a catalyst system comprising:
(1) titanium based catalyst component obtained by
(i) reacting (A) $Mg(OR)(OR')$ with (B) a silicon compound having at least one silicon-hydrogen bond,
(ii) contacting the reaction product with (C) an electron donor compound,
(iii) contacting the product from step (ii) with an organoaluminum compound, and,
(iv) contacting the the step (iii) product with a titanium compound, wherein R and R' are radicals selected from alkyl, alkenyl, cycloalkyl, aryl, and aralkyl radicals and R and R' may be the same or different;
(2) an organoaluminum cocatalyst.

4,588,794

PROCESS FOR PRODUCTION OF RUBBERY ETHYLENE/1-BUTENE/POLYENE COPOLYMERS

Hidekuni Oda, Iwakuni; Kazuhiko Murata; Hirokazu Kajiura, both of Ohtake, and Akira Matsuda, Ichihara, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Japan

Continuation of Ser. No. 444,061, Nov. 23, 1982, abandoned, which is a continuation of Ser. No. 232,389, Feb. 7, 1981, abandoned, which is a division of Ser. No. 49,207, Jun. 15, 1979, abandoned. This application Aug. 28, 1984, Ser. No. 644,670
Claims priority, application Japan, Apr. 13, 1979, 54-44274; Apr. 13, 1979, 54-44275; Apr. 13, 1979, 54-44276
Int. Cl.[4] C08F 4/68
U.S. Cl. 526—169.2 8 Claims

1. A process for producing a rubbery copolymer of ethylene, 1-butene and a polyene having (A) an ethylene/1-butene mole ratio of from 86/14 to 95/5, (B) an iodine value of from 2 to 40, (C) an intrinsic viscosity [η], measured in decalin at 135° C., of from 0.8 to 4 dl/g, (D) a weight average molecular weight-/number average molecular weight ratio ($\overline{Mw}/\overline{Mn}$) of less than 3, (E) [η]/[η]I of from 0.2 to 0.9 in which [η] is the intrinsic viscosity of the copolymer and [η]I is the intrinsic viscosity of an ethylene/1-butene random copolymer having an ethylene content of 90 mole % and the same weight average molecular weight, determined by a light scattering method, as that of the rubbery copolymer and (F) the polyene is at least one member selected from the group consisting of dicyclopentadiene, 5-vinyl-2-norbornene and 5-ethylidene-2-norbornene; which comprises copolymerizing ethylene, 1-butene and the polyene in an inert hydrocarbon medium at a temperature of from about 40° C. to about [100° C.] 80° C., and at a pressure of from atmospheric pressure to 20 kg/cm^2.G in the presence of a catalyst consisting essentially of
(a) a vanadium compound of the formula

$$VO(OR)_nX_{3-n}$$

wherein R represents a C_1–C_{20} alkyl group, X represents a halogen atom, and n represents a positive number within the range of $1 \leqq n \leqq 1.5$, wherein said vanadium compound (a) is at least one compound selected from the group consisting of $VO(OCH_3)Cl_2$, $VO(OC_2H_5)Cl_2$, $VO(OC_2H_5)_{1.5}Cl_{1.5}$, $VO(OC_2H_5)_{1.5}Br_{1.5}$, $VO(OC_3H_7Cl_2$, $VO(OC_3H_7)_{1.5}Cl_{1.5}$, $VO(O\ n\text{-}C_4H_9)Cl_2$, and $VO(OC_5H_{11})_{1.5}Cl_{1.5}$, and
(b) an organoaluminum compound of the formula

$$R'_mAlX'_{3-m}$$

wherein R' represent a hydrocarbon group X' represents a halogen atom, and m represents a positive number within the range of $1.2 \leqq m \leqq 1.4$, wherein said organoaluminum compound is a mixture of of $C_2H_5AlCl_2$ and $(C_2H_5)_{1.5}AlCl_{1.5}$, a mixture of iso-$C_4H_9AlCl_2$ and (iso-$C_4H_9)_{1.5}AlCl_{1.5}$, or a mixture of $C_2H_5AlCl_2$ and (iso-$C_4H_9)_{1.5}AlCl_{1.5}$, the Al/V mole ratio in the catalyst being from 5 to 20.

4,588,795

OXYANION-CATALYZED POLYMERIZATION

Ira B. Dicker; William B. Farnham, both of Wilmington, Del.; Walter R. Hertler, Kennett Square, Pa.; Evan D. Laganis; Dotsevi Y. Sogah, both of Wilmington, Del.; Thomas W. Del Pesco, Hockessin, Del., and Patrick H. Fitzgerald, Pitman, N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 1, 1985, Ser. No. 707,193
Int. Cl.[4] C08F 4/16
U.S. Cl. 526—192 52 Claims

1. Polymerization process comprising contacting under polymerizing conditions at least one polar, acrylic type alpha-olefinic monomer with (i) a tetracoordinate organosilicon, organotin or organogermanium polymerization initiator having at least one initiating site, and (ii) a catalyst which is a salt comprising a suitable cation and an oxyanion which can form a conjugate acid having a pKa (DMSO) of about 5 to about 24.

4,588,796

FLUOROOLEFIN POLYMERIZATION PROCESS USING FLUOROXY COMPOUND SOLUTION AS INITIATOR

Robert C. Wheland, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 603,289, Apr. 23, 1984, Pat. No. 4,535,136. This application May 31, 1985, Ser. No. 739,664
Int. Cl.[4] C08F 2/00, 214/18, 4/32
U.S. Cl. 526—214 15 Claims

1. A process for polymerizing one or more olefin monomers, at least one of which is fluorinated, comprising contacting said monomers with a fluoroxy compound solution of at least one fluoroxy compound, said solution containing an acyl hypofluorite compound of the formula RCOOF and having a fluoroxy compound concentration of at least 0.5 meq/liter; said concentration containing, based on the total number of equivalents of fluoroxy compounds present, about 35 to 100% of RCOOF; other fluoroxy compounds in said solution having the formulae RCF_2OF and $RCF(OF)_2$; wherein for each occurrence R is $CF_3CF_2CF_2O[CF(CF_3)CF_2O]_mCF(CF_3)$— and m is 0 to 50.

4,588,797

COMPOSITION COMPRISING AMIDE, LITHIUM HALIDE AND ORGANIC SULFONE

Benedict S. Curatolo, Maple Heights, and Gerald P. Coffey, Lyndhurst, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Division of Ser. No. 451,194, Dec. 20, 1982, Pat. No. 4,481,354. This application Nov. 5, 1984, Ser. No. 668,223
Int. Cl.[4] C08F 2/00
U.S. Cl. 526—225 4 Claims

1. A composition comprising
(a) a compound containing an amide group;
(b) a lithium halide; and
(c) an organic sulfone of the formula $R_1—SO_2—R_2$ wherein R_1 and R_2 are each independently phenyl, methyl, ethyl or mixtures thereof.

4,588,798

PROCESS FOR PREPARING ACRYLIC POLYMER SHEETS USING A DUAL PEROXIDE INITIATOR SYSTEM

Barry J. Heitner, Bartlett, Tenn., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 1, 1985, Ser. No. 697,402
Int. Cl.[4] C08F *4/38, 20/14*
U.S. Cl. 526—228 5 Claims

1. In a process for preparing an acrylic polymer sheet, said polymer selected from the group consisting of methyl methacrylate homopolymer, copolymers of methyl methacrylate with α,β-ethylenically unsaturated compounds and mixtures thereof, which process comprises polymerizing a syrup having a viscosity of 0.5–100 poises at 25° C. and containing 10–40% by weight of a methyl methacrylate homopolymer, copolymer of methyl methacrylate with α,β-ethylenically unsaturated compounds, said copolymer comprising a major portion of methyl methacrylate or mixtures thereof, in monomeric methyl methacrylate, the improvement which comprises

mixing said syrup with an initiator solution to give concentration of between about 0.3 to 16 moles per 1 million grams of syrup of a first peroxide initiator which has a 5-minute half-life at temperatures between about 75° C. to 100° C. and which emits a maximum of 1 mole of carbon dioxide per 2 moles of free radicals, and of between about 0.1 to 6 moles per 1 million grams of syrup of a second peroxide initiator which has a 1 minute half-life at temperatures between about 105° C. to 125° C. and which emits a maximum of 1 mole of carbon dioxide per 1 mole of free radicals,

first heating the mixture of said syrup and said initiator solution to a temperature of between about 45° C. to 90° C. for between about 10 to 100 minutes wherein about 80–90% polymerization occurs, and subsequently heating said mixture to a temperature of between about 120° C. to 140° C. wherein at least 97.5% polymerization occurs.

4,588,799

REIMPREGNATION RESIN COMPRISING REACTION PRODUCT OF METAL COMPLEX AND FURFURYL ALCOHOL

Robert B. Petersen, Los Angeles, Calif., assignor to Hitco, Newport Beach, Calif.

Filed May 18, 1984, Ser. No. 611,729
Int. Cl.[4] C08G *79/00*
U.S. Cl. 528—9 4 Claims

1. A polymer comprising the reaction product of (1) furfuryl alcohol and (2) a metal complex comprising the reaction product of furfurylamine and a metal carbonyl selected from the group consisting of tungsten carbonyl, molybdenum carbonyl and chromium carbonyl.

4,588,800

PLATINUM-NITROGEN COMPLEX CATALYSTS

Frederick J. Palensky, St. Paul, and Allen R. Siedle, Lake Elmo, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 402,231, Jul. 27, 1982, Pat. No. 4,511,715, which is a continuation-in-part of Ser. No. 245,927, Mar. 20, 1981, abandoned. This application Jan. 7, 1985, Ser. No. 689,184
Int. Cl.[4] C08G *77/06*
U.S. Cl. 528—15 21 Claims

1. An addition curable composition of matter comprising:

a. an organosilicone compound having more than one silicon-hydrogen bond,

b. an organic compound having more than one pair of aliphatic carbon atoms linked by multiple bonds, and

c. a catalytic amount of at least one complex compound selected from the class of complex compounds having the formulae:

(1) monometallic complexes, $(L)PtX_2(Y)$,

(2) bimetallic complexes, $(L)(PtX_2)_2(Y)_2$,

(3) ionic complexes, $(L)PtX_2(Y)(Z)$, and

(4) reduced forms of said monometallic complexes having the formulae:

$$H[(PNZ)PtX_2(Q)]_2, \quad (a)$$

$$[(PNZ)PtX_2(Q)]_2^-A^+, \quad (b)$$

and

$$[H(PNZ)PtCl_2(C_2H_4)]_3PtCl_3 \quad (c)$$

wherein

L is a single or fused ring unsaturated heterocyclic ligand, wherein said hetero atoms are nitrogen, comprising at least one 5- or 6-member ring, said ligand having 2 to 4 nitrogen atoms in the same ring, and said ligand having up to a total of 44 carbon atoms,

Y is an uncharged monodentate ligand that fills only one coordination position of the platinum atom and is selected from olefinically unsaturated hydrocarbons, triarylphosphines or triarylarsines wherein aryl is phenyl or phenyl substituted by up to 4 lower alkyl groups having 1 to 4 carbon atoms, dialkyl sulfides wherein each alkyl group independently has 1 to 16 carbon atoms, and carbon monoxide, the ligand having up to 25 carbon atoms,

X is independently Cl, Br, I, CN, or SCN,

Z is HCl, HBr, or silver trifluoromethanesulfonate,

Q is an olefinically unsaturated hydrocarbon ligand of 2 to 25 carbon atoms,

A is a solubilizing cation, and

PNZ is phenazine.

4,588,801

POLYSILANE POSITIVE PHOTORESIST MATERIALS AND METHODS FOR THEIR USE

Larry A. Harrah, and John M. Zeigler, both of Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 5, 1984, Ser. No. 597,005
Int. Cl.[4] C08G *77/04*
U.S. Cl. 528—33 18 Claims

1. A polysilane which is substantially free of low molecular weight oligomers or cyclic materials and whcih comprises recurring units of

$$-Si(X)(Y)-$$

wherein

X and Y together have 4–13 carbon atoms, and

X and Y each indepedently is hydrogen, alkyl, cycloalkyl, substituted phenyl, 1- or 2-naphthyl, or phenylalkyl, or together X and Y are an alkylene group forming a ring with the adjoining Si atom, wherein X and Y groups which are not H can optionally be substituted by one of C_{1-6}-alkoxy, mono- or di-(C_{1-3}-alkyl)amino, C_{2-6}-alkanoyl or the corresponding C_{2-3}-ketal thereof, C_{1-6}-alkyl, $-NH_2$ or —OH; with the proviso that only one of X and Y can be substituted phenyl,

and wherein, as a result of the selection of X and Y, said polysilane has sufficient photosensitivity to depolymerize upon exposure to actinic radiation, forming products which volatilize.

4,588,802

POLYURETHANES BASED ON POLYETHER BLENDS

Eugene Y. C. Chang, Bridgewater, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Aug. 9, 1984, Ser. No. 638,594
Int. Cl.[4] C08G *18/24, 18/48, 18/76*
U.S. Cl. 528—58 4 Claims

1. A reaction injection molding composition consisting essentially of:

(a) an ethylene oxide-capped polypropylene glycol polyether having a number average equivalent weight of from about 400 to about 4,000 and having a functionality of from about 3.0 to about 5.0;

(b) an ethylene oxide-capped polypropylene glycol polyether having a number average equivalent weight of from about 300 to 4,000; and having a functionality of about 2,0;

wherein the weight ratio of (a) to (b) is from about 70:30 to about 30:70, respectively;

(c) from about 2 to 20 parts by weight of a 1,4-butanediol chain extender, based on 100 parts by weight of (a) plus (b);

(d) from about 0.001 to about 5.0 parts by weight of an organic tin compound catalyst, based on 100 parts by weight of (a) plus (b); and

(e) an amount of para-tetramethylxylylene diisocyanate, or a polyurethane prepolymer having terminally reactive isocyanate groups and formed as a reaction product of a stoichiometric excess of para-tetramethylxylylene diisocyanate and a polymeric diol, to provide a stoichiometric index of NCO equivalents to OH equivalents in the overall composition of from about 0.95 to about 1.15.

4,588,803

POLYURETHANE SEALANT COMPOSITIONS AND THEIR USE AS THERMAL-BREAK SEALANTS

Donald L. Christman, Grosse Ile, Mich., assignor to BASF Corporation, Wyandotte, Mich.

Filed Nov. 14, 1984, Ser. No. 671,452
Int. Cl.[4] C08G *18/32, 18/18*
U.S. Cl. 528—78 8 Claims

5. A thermal break composition for use in the manufacture of door frames and windows which comprises a composition prepared by reacting

(a) a polyoxyalkylene polyether glycol,

(b) an ethylene oxide adduct of toluenediamine having a molecular weight range from about 300 to 700,

(c) triisopropanolamine,

(d) optionally pigment, catalyst and inorganic filler, and

(e) an organic polyisocyanate,

wherein the ratio of the polyether glycol to the adduct of toluenediamine is from about 2:1 to about 1:1, wherein the ratio of the adduct of toluenediamine to triisopropanolamine is from about 10:1 to about 2:1, and wherein the ratio of isocyanate groups to the hydroxyl groups of the polyether glycol is 1.0:1 to 1.5:1.

4,588,804

POLYIMIDE COMPOSITIONS

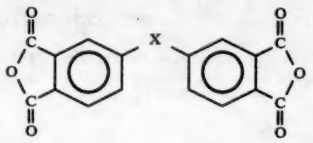
Michael Fryd, Haddonfield, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 4, 1984, Ser. No. 607,290
Int. Cl.[4] C08G *73/10*
U.S. Cl. 528—125 17 Claims

1. A polyimide derived from dehydration of a polyamic acid which is the liquid phase condensation reaction product of a solution in aprotic solvent of approximately equimolar amounts of aromatic dianhydride and aromatic diamine consisting essentially of:

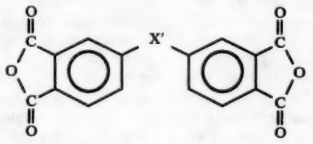
(1) A dianhydride reactant wherein

a. 50–100 mole % of the dianhydride reactant corresponds to the formula:



in which X is a 2,2-perfluoropropylene moiety;

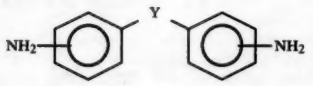
b. 50–0 mole % of the dianhydride reactant corresponds to the formula:



in which X' is a divalent moiety containing no aliphatic carbon-carbon or carbon-hydrogen bonds; and

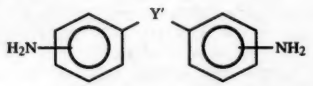
(2) A diamine reactant wherein

c. 20–100 mole % of the diamine reactant corresponds to the formula:



in which Y is a sulfone moiety; and

d. 80–0 mole % of the diamine reactant corresponds to the formula:



in which Y' is a nonelectron withdrawing moiety.

4,588,805

SULFONATE-TERMINATED POLYIMIDES AND POLYAMIC ACIDS AND METHOD FOR THEIR PREPARATION

Robert E. Williams, Jr., Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sep. 6, 1984, Ser. No. 647,596
Int. Cl.[4] C08G *73/10*
U.S. Cl. 528—172 20 Claims

1. A sulfonate-terminated polymer having formula I in the drawings, wherein M is one equivalent of a cation; A is a tetravalent aromatic radical; R^1 is a divalent aliphatic or aromatic radical; R^2 is an aromatic hydrocarbon radical containing about 6–20 carbon atoms or a halogenated derivative thereof, an alkylene or cycloalkylene radical containing about 2–20 carbon atoms, or a bis-alkylenepoly(dialkylsiloxane) radical; in each individual instance, X^1 is OH and Y^1 is NH, or X^1 and Y^1 taken together are N; and n is at least about 5.

4,588,806

POLYPHENYLENE ETHER RESINS HAVING BIMODAL MOLECULAR WEIGHT DISTRIBUTIONS AND METHOD OF THEIR FORMATION

David F. Aycock, Glenmont, N.Y., and Philip L. Kinson, Brecksville, Ohio, assignors to General Electric Company, Selkirk, N.Y.

Filed Nov. 8, 1984, Ser. No. 669,573
Int. Cl.[4] C08G 65/44
U.S. Cl. 528—215 10 Claims

1. A process for forming a polyphenylene ether resin which is characterized by having at least two distinct molecular weight distributions as determined by gel permeation chromatography, the gel permeation chromatography showing at least two peaks, one of which has a maximum value greater than 30,000 and the other of which has a maximum value of less than 30,000, said number values representing standard polystyrene equivalent molecular weights, comprising:

(a) providing a solution of one or more reactive phenolic compounds and a copper-amine complex polymerization catalyst in a solvent;

(b) contacting the solution with oxygen or an oxygen-containing gas at a temperature not less than 30° C., without adding any more of the phenolic compounds, to cause a polymerization reaction and to form a mixture of a polyphenylene ether resin, by-product water and by-product diphenoquinone, said diphenoquinone being in an amount not less than one percent by weight, based on the weight of unreacted phenolic compounds;

(c) reacting the mixture from step (b), at a temperature not less than 30° C., in the presence of a chelating agent for the copper-amine catalyst and not less than one percent by weight of said by-product diphenoquinone, based on the weight of unreacted phenolic compounds, until the polyphenylene ether resin which is characterized by two distinct molecular weight distributions has been formed; and

(d) recovering the polyphenylene ether resin formed in step (c).

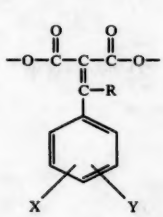
4,588,807

BENZYLIDENEMALONIC OR VINYLOGOUS BENZYLIDENEMALONIC ACID POLYESTERS, THEIR PREPARATION AND THEIR USE FOR THE UV STABILIZATION OF THERMOPLASTICS

Thomas Scholl; Reinhard Preuss, both of Krefeld, Fed. Rep. of Germany; Burkhard Lachmann, Nova Iguacu RJ, Brazil; Hartmüt Löwer, Hilden, and Peter R. Müller, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 17, 1984, Ser. No. 661,760
Claims priority, application Fed. Rep. of Germany, Oct. 26, 1983, 3338860; Mar. 17, 1984, 3409921
Int. Cl.[4] C08G 63/02
U.S. Cl. 528—272 22 Claims

1. A benzylidenemalonic or vinylogous benzylidenemalonic acid polyester containing structural units of the general formula



wherein

R denoted hydrogen, C_1–C_4-alkyl or phenyl and X and Y are identical or different and denote hydrogen, hydroxyl, methoxy, phenoxy, C_1–C_4-alkyl, phenyl, chlorine or bromine, characterized in having a number average molecular weight of 970 to 9,000, an OH number of 5 to 115 and a COOH number of 0 to 8.

4,588,808

TWO-STAGE PROCESS AND PRODUCT FOR PRODUCING POLYBENZIMIDAZOLES FROM FREE DICARBOXYLIC ACIDS

Bennett C. Ward, Pineville, N.C., assignor to Celanese Corporation, New York, N.Y.

Filed Aug. 31, 1984, Ser. No. 645,952
Int. Cl.[4] C08G 73/18
U.S. Cl. 528—337 8 Claims

1. A two-stage inert atmosphere melt polymerization process for the preparation of high molecular weight polybenzimidazoles comprising heating in a first stage a mixture of at least one aromatic tetraamine containing two pairs of amine substituents on an aromatic ring in orthoposition and at least one dicarboxylic acid to condensation polymerization temperatures above the melting point of said tetraamine, continuing the heating with agitation until the agitation torque is about 1.5 to about 6 times the torque before the rise in viscosity begins, terminating the agitation while continuing to heat the reaction mixture to a temperature of from 230° to 350° C. while allowing the mass to foam, cooling to a friable foamed mass, crushing the mass to obtain a ground prepolymer and heating the ground prepolymer in a second stage at a temperature in excess of the highest temperature employed in said first stage with agitation until an inherent viscosity in excess of 0.37 is obtained.

6. The process of claim 1 wherein a catalyst for the reaction is employed.

7. The process of claim 6 wherein said catalyst is triphenylphosphite.

4,588,809

PROCESS FOR ISOLATING PULVERULENT CHLORINATED ALIPHATIC POLYMERS FROM THEIR ALIPHATIC CHLOROHYDROCARBON SOLUTIONS

Karl-Heinrich Meyer, Krefeld; Diez Heine, Leverkusen; Franz Alfes, Krefeld, and Wolfgang Eisermann, Duesseldorf, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 19, 1984, Ser. No. 672,463
Claims priority, application Fed. Rep. of Germany, Nov. 30, 1983, 3343322
Int. Cl.[4] C08F 6/12
U.S. Cl. 528—500 8 Claims

1. A process for isolating pulverulent chlorinated aliphatic polymers from their aliphatic chlorohydrocarbon solutions wherein a mixture of 10 to 30% by weight of steam and 90 to 70% by weight of an organic solvent A is introduced into the aliphatic chlorohydrocarbon solution of the chlorinated aliphatic polymer, the aliphatic chlorohydrocarbon is removed by steam distillation together with an azeotropic water content, the resulting 70 to 90 percent by weight strength aqueous dispersion of the chlorinated aliphatic polymer dissolved in solvent A is introduced into a coagulation bath of boiling water, solvent A is removed by steam distillation and the coagulated chlorinated aliphatic polymer is isolated and dried,

wherein said organic solvent A is a solvent for the chlorinated aliphatic polymer, contains no aliphatically bonded halogen, has a higher boiling point than the aliphatic chlorohydrocarbon and which forms a binary azeotrope with water.

4,588,810

BASIC TRIPHENDIOXAZINE DYESTUFFS

Wolfgang Harms, Leverkusen; Günter Franke, Leichlingen, and Klaus Wunderlich, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

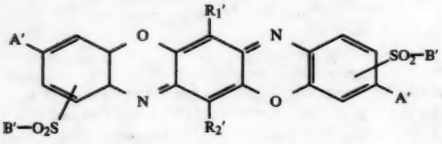
Filed Dec. 4, 1984, Ser. No. 677,782

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1983, 3344472

Int. Cl.[4] C09B *19/00, 19/02*

U.S. Cl. 544—76 **5 Claims**

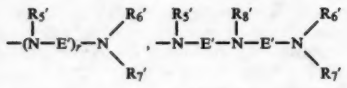
1. Triphendioxazine dyestuffs of the formula

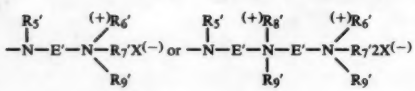


wherein

R_1' and R_2' each denote hydrogen or halogen,

A' and B' each denote a radical of the formulae



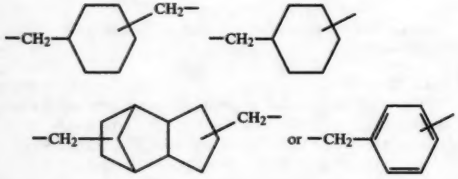


r denotes 0 or 1,

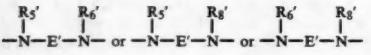
R_5'–R_9' each denote hydrogen or C_1–C_4-alkyl which is optionally substituted by hydroxyl, C_1–C_4-alkoxy, halogen, cyano, C_1–C_4-alkoxycarbonyl or C_1–C_4-alkylcarbonyl,

R_9' also denotes optionally C_1–C_4-alkyl-, hydroxyl-, C_1–C_4-alkoxy- or halogen-substituted benzyl or phenylethyl and

E' denotes C_2–C_6-alkylene, cyclohexylene, phenylene or a radical of the formulae



wherein the six-membered rings can be substituted by C_1–C_4-alkyl, or



each represent an optionally C_1–C_4-alkyl-substituted piperazine or imidazolidine ring, or R_7'—N—R_9' represents an optionally C_1–C_4-alkyl-substituted piperidine, morpholine, piperazine or pyrrolidine ring or

represents an optionally C_1–C_4-alkyl-substituted pyridinium radical and

$X^{(-)}$ represents an anion, and at least one of the radicals A' and B' stands for one of said optionally protonated or quaternised polyamine radicals.

4,588,811

DYESTUFF QUINOPHTHALONE DERIVATIVES

Jean-Marie Adam, Rosenau, France, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

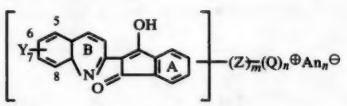
Continuation of Ser. No. 471,555, Mar. 2, 1983, abandoned. This application Nov. 19, 1984, Ser. No. 672,869

Claims priority, application Switzerland, Mar. 10, 1982, 1474/82

Int. Cl.[4] C07D *401/10, 413/10, 417/10*

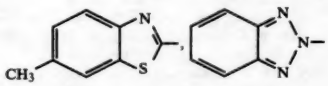
U.S. Cl. 544—128 **9 Claims**

1. A quinophthalene compound of the formula

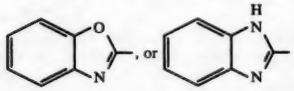


wherein

Y is



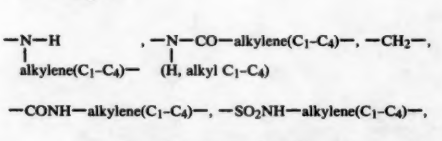
(1) (2)



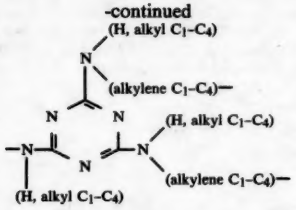
(3) (4)

said groups (1) to (4) being unsubstituted or substituted by OH, C_1–C_4-alkyl or halogen,

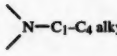
Z is a polyvalent bridge member selected from the group consisting of



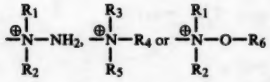
-continued



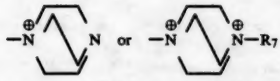
wherein each of the alkyl and alkylene groups appearing in said members is unsubstituted or is further substituted by OH, halogen, HN_2 or



Q is a cationic radical fo the formula



in which R_1 to R_6 independently of one another are each C_1–C_4 alkyl which is unsubstituted or substituted by OH, NH_2, —N(C_1–C_4 alkyl)$_2$ or phenyl, or R_1 and R_2 or R_3 and R_4 together with the N atom form in each case the morpholine, pyrrolidine, piperidine, piperazine, imidazole or triazole ring: or R_3 and R_4 and R_5 together form the pyridinium ring which is unsubstituted or substituted by C_1–C_4-alkyl, or form a triethylenediamine ring of the formula



wherein R_7 is C_1–C_4-alkyl which is unsubstituted or substituted by —NH_2, —NH—C_1–C_4-alkyl or —N(C_1–C_4-alkyl)$_2$,

m is 1 or 2,

n is 1 or 2, and

An is an anion:

and wherein the nucleus A is unsubstituted or is substituted by halogen, straight or branched chain C_1–C_4 alkyl, NO_2, NH_2, NHCO—C_1–C_4alkyl, COO—C_1–C_4alkyl, C_1–C_4alkoxy, S—C_1–C_4alkyl, SO_2—C_1–C_4alkyl, NHCO-phenyl, COO-phenyl, phenoxy, thiophenoxy or SO_2-phenyl and

the nucleus B is unsubstituted or is substituted by halogen, straight or branched chain C_1–C_4 alkyl, OH, C_1–C_4alkoxy, phenoxy, NH—C_1–C_4alkyl, NH-phenyl, S—C_1–C_4alkyl, thiophenoxy, SO_2—C_1–C_4alkyl, SO_2-phenyl, COO—C_1–C_4alkyl, or COO-phenyl.

4,588,812

SUBSTITUTED 2,3-DIHYDRO-5H-THIAZOLO[2,3,-B]QUINAZOLINE DERIVATIVES

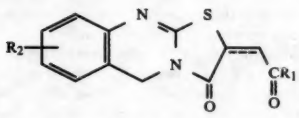
Grace A. Saeva, and Vassil S. Georgiev, both of Rochester, N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed May 30, 1984, Ser. No. 615,201

Int. Cl.[4] C07D *513/04;* A61K *31/505*

U.S. Cl. 544—250 **14 Claims**

1. A compound of the formula



wherein

R_1 is OH, C_1–C_4 alkoxy, NR_3R_4, or phenoxy optionally substituted in its phenyl ring with C_1–C_4 alkyl, alkoxy(C_1–C_{18}, branched or unbranched chain), NO_2, NH_2, C_1–C_4 alkylamino, halogen, OH, or trifluoromethyl,

R_2 is H, C_1–C_4 alkyl, alkoxy(C_1–C_{18}, branched or unbranched chain), halogen, trifluoromethyl, NO_2, or NH_2,

R_3 and R_4 are independently H, C_1–C_4 alkyl, C_3–C_7 cycloalkyl, phenyl, allyl, propargyl, 1-adamantanemethyl, benzyl, or R_3 and R_4 together with the N adjacent to R_3 and R_4 form a C_4–C_6 heterocyclic ring, and

the exocyclic bond designated by a combination of a dashed line and a straight line in parallel represents either an unsaturated double bond or a saturated bond, provided that, when the exocyclic bond is a saturated bond, R_1 is neither phenylamino nor OH.

4,588,813

1-PYRAZINYL-1-PROPANONE DERIVATIVES USEFUL AS FLAVORANTS IN SMOKING COMPOSITIONS

Yoram Houminer; Everett W. Southwick, and David L. Williams, all of Richmond, Va., assignors to Philip Morris Incorporated, New York, N.Y.

Division of Ser. No. 467,412, Feb. 17, 1983. This application Sep. 7, 1984, Ser. No. 648,424

Int. Cl.[4] C07D *241/12*

U.S. Cl. 544—406 **4 Claims**

1. 1-Pyrazinyl-2,2-dimethyl-1-propanone.

4. 1-[6-(2-Methyl-1-propyl)-2-pyrazinyl]-1-propanone.

4,588,814

PROCESS FOR THE PREPARATION OF 3,4,9,10-PERYLENETETRACARBOXYLIC ACID DIIMIDE

Ernst Spietschka, Idstein/Taunus, and Manfred Urban, Wiesbaden, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 19, 1984, Ser. No. 601,862

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1983, 3314430; Dec. 17, 1983, 3345810

Int. Cl.[4] C07D *221/14, 471/06*

U.S. Cl. 546—37 **1 Claim**

1. A process for the preparation of 3,4,9,10-perylenetetracarboxylic acid diimide with a high degree of purity and in a high yield in which yield the amount of 100% 3,4,9,10-perylene-tetracarboxylic acid diimide is comparatively high, by fusing naphthalane-1,8-dicarboxylic acid imide with potassium hydroxide and sodium acetate to give the alkali metal salt of the leuko compound of 3,4,9,10-perylenetetracarboxylic acid diimide, diluting the melt with water, when the reaction has ended, and oxidizing the leuko form to 3,4,9,10-perylenetetracarboxylic acid diimide, which comprises

(a) applying a vacuum of less than 100 mm Hg before the naphthalene-1,8-dicarboxylic acid imide is introduced into the potassium hydroxide/sodium acetate melt, heating the

potassium hydroxide/sodium acetate mixture to 250°–300° C., and hereby dehydrating this mixture such that the melt obtained is still stirrable at 200°–220° C. under industrial conditions, subsequently introducing the naphthalene-1,8-dicarboxylic acid imide or its sodium or potassium salt into the above melt at 200°–220° C. under normal pressure and heating this melt, in the absence of atmospheric oxygen, at 250°–300° C. until formation of the alkali metal salt of the leuko compound is complete, or

(b) applying a vacuum of less than 100 mm Hg after the naphthalene-1,8-dicarboxylic acid imide or its sodium or potassium salt has been introduced into the potassium hydroxide/-sodium acetate melt at 200°–220° C. under normal pressure, heating the mixture to 200°–250° C. and hereby dehydrating it such that the melt obtained is still stirrable at 200°–220° C. under industrial conditions, and subsequently heating the melt, in the absence of atmospheric oxygen, at 250°–300° C. until formation of the alkali metal salt of the leuko compound is complete, or

(c) introducing the sodium or potassium salt of the naphthalene-1,8-dicarboxylic acid imide into the potassium hydroxide/sodium acetate melt at 200°–220° C. under normal pressure and heating the melt, in the absence of atomospheric oxygen, at 250°–300° C. until the formation of the alkali metal salt of the leuko compound is complete.

4,588,815

METHOD FOR MANUFACTURING PYRIDINE AND PYRIDINE DERIVATIVES FROM ALKYNES AND CYANO COMPOUNDS IN THE PRESENCE OF COMPLEX COBALT OR RHODIUM COMPOUNDS WITH LIGANDS CONTAINING BORON

Helmut Bönnemann, Essen, Fed. Rep. of Germany, assignor to Studiengesellschaft Kohle mbH, Mulheim an der Ruhr, Fed. Rep. of Germany

Continuation of Ser. No. 371,872, Apr. 26, 1982, abandoned. This application Mar. 8, 1984, Ser. No. 587,349

Claims priority, application Fed. Rep. of Germany, May 2, 1981, 3117363

Int. Cl.⁴ C07D *213/12*

U.S. Cl. 546—250 **36 Claims**

1. A process for forming pyridine or pyridine substituted by alkyl, aryl, aralkyl or alkenyl which comprises contacting an alkyne with a cyano compound in the presence of a cobalt or rhodium catalyst which has one or two organo ligands with one or two boron atoms at −10° to +150° C. under pressure such that the reactants are at least partially in the liquid phase.

4,588,816

PREPARATION OF (2-(6-SUBSTITUTED)-PYRIDINYLOXY)ALKANOLS FROM 2-(6-SUBSTITUTED)PYRIDINOLS AND ORGANIC CARBONATES

Abel Mendoza, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 420,173, Sep. 20, 1982, abandoned. This application May 8, 1984, Ser. No. 608,069

Int. Cl.⁴ C07D *213/64*

U.S. Cl. 546—301 **14 Claims**

1. A process for the preparation of (2-(6-substituted)-pyridinyloxy)alkanols comprising contacting a 2-(6-substituted)pyridinol with an organic carbonate at a temperature of between about 0° C. and 250° C., under conditions such that the (2-(6-substituted)pyridinyloxy)alkanols are prepared in a 50 percent by weight yield or greater.

4,588,817

ANTIBIOTIC NODUSMICINS

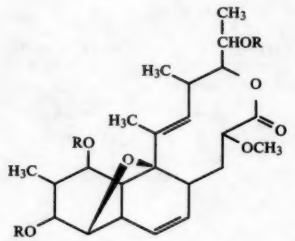
Barney J. Magerlein, and Howard A. Whaley, both of Portage, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 273,993, Jun. 15, 1981, Pat. No. 4,461,903, which is a division of Ser. No. 175,409, Aug. 6, 1980, Pat. No. 4,360,683. This application Jun. 4, 1984, Ser. No. 616,640

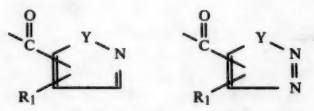
Int. Cl.⁴ C07D *407/02, 413/02*

U.S. Cl. 548—125 **4 Claims**

1. A compound of the formula

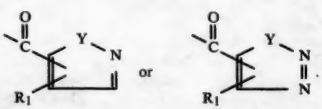


where R is H in no more than two positions at the same time, a blocking group selected from the group consisting of trisubstituted silyl ethers, substituted and unsubstituted tetrahydropyranyl ethers, Beta,Beta,Beta-trichloroethyl ether Beta-methoxyethoxymethyl ether and carbonate esters in at least one position, or a radical of the formulae



wherein Y is selected from the group consisting of NH, S and O;

can be at any one of the unoccupied ring carbon atoms; and R_1 is selected from the group consisting of H, OH, halogen, NO_2, alkyl of 1 to 8 carbon atoms, inclusive, NH_2, NR_4R_5, wherein R_4 and R_5 is selected from the group consisting of H, OH, and alkyl and substituted alkyl, wherein the alkyl is from 1 to 8 carbon atoms, inclusive, and the substituent on substituted alkyl is selected from the group consisting of OH, halogen, H, and SH; O alkyl, S alkyl, O acyl, and N acyl, wherein the acyl radical is from 1 to 18 carbon atoms, inclusive; or a halo-, nitro-, hydroxy-, amino-, cyano-, thicyano-, or loweralkyloxy-substituted hydrocarbon acyl radical of from 2 to 18 carbon atoms, provided that one of R is always either



4,588,818

METHOD FOR RECOVERY OF OPTICALLY ACTIVE TRYPTOPHANE

Tetsuya Kaneko, Kawasaki; Toshio Kitahara, Yokosuka, and Toyokazu Kaneko, Sagamihara, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Nov. 7, 1984, Ser. No. 668,940
Claims priority, application Japan, Nov. 10, 1983, 58-211593
Int. Cl.[4] C07D *209/20*
U.S. Cl. 548—498 **10 Claims**

1. A method for the recovery of optically active tryptophane, which comprises:

filtering a solution of optically active tryptophane containing impurities through a semipermeable membrane;

adding a lower alcohol or acetone to the filtrate;

maintaining said solution containing said lower alcohol or acetone at an alkaline pH by the addition of alkaline hydroxide and at a temperature higher than the α/β crystalline transition point;

adding acid to said solution, thereby causing α-crystals of optically active, substantially pure L or D-tryptophane to form in said solution; and

separating said crystals from said solution containing impurities.

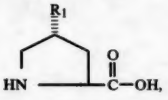
4,588,819

PROCESS AND INTERMEDIATES FOR PREPARING TRANS-4-SUBSTITUTED-S-PROLINES

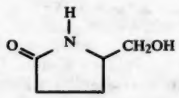
John K. Thottathil, Trenton, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Nov. 19, 1984, Ser. No. 672,989
Int. Cl.[4] C07D *207/12*
U.S. Cl. 548—532 **10 Claims**

1. A process for preparing a 4-substituted proline derivative having the formula

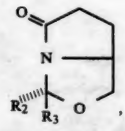


which comprises reacting the compound having the formula

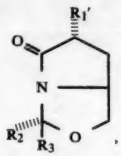


with a compound having the formula

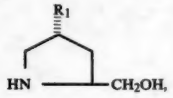
to obtain a compound having the formula



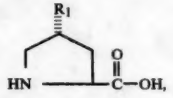
alkylating that compound to obtain a compound having the formula



converting that compound to a compound having the formula



and oxidizing that compound to yield the desired proline having the formula



wherein R_1 is alkyl, cycloalkyl, aryl or arylalkyl, R_1' is alkyl, cycloalkenyl, aryl or arylalkyl, R_2 is alkyl, aryl, arylalkyl or cycloalkyl, and R_3 is hydrogen, alkyl, aryl, arylalkyl or cycloalkyl; wherein the term "aryl" refers to phenyl or phenyl substituted with halogen, alkyl, alkoxy, alkylthio, hydroxy, alkanoyl, nitro, amino, dialkylamino, or trifluoromethyl groups;

the terms "alkyl" and "alkoxy" refer to groups having 1 to 10 carbon atoms;

the terms "cycloalkyl" and "cycloalkenyl" refer to groups having 3 to 7 carbon atoms; and

the term "alkanoyl" refer to groups having 2 to 9 carbon atoms.

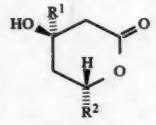
4,588,820

PROCESS FOR EPIMERIZATION AT C_6 OF 3,4,5,6-TETRAHYDRO-2H-PYRAN-2-ONE

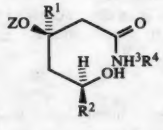
Gerald E. Stokker, Gwynedd Valley, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Jun. 11, 1984, Ser. No. 619,506
Int. Cl.[4] C07D *309/10*
U.S. Cl. 549—292 **3 Claims**

1. A process for preparing a compound of structural formula:



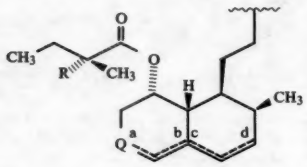
which comprises treating a compound of structural formula:



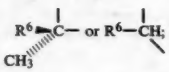
with an organic-sulfonyl halide of structural formula:

R^5SO_2X

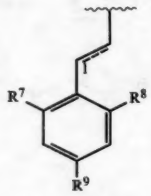
wherein:
X is halo;
Z is a carbinol protecting group;
R^1 is
(a) hydrogen, or
(b) methyl; R^3 and R^4 are independently
(a) hydrogen,
(b) C_{1-3} alkyl, or
(c) phenyl-C_{1-3} alkyl, wherein the phenyl is unsubstituted or substituted with
(i) C_{1-3} alkyl,
(ii) C_{1-3} alkoxy or
(iii) halo;
R^2 is
(a)



wherein Q is



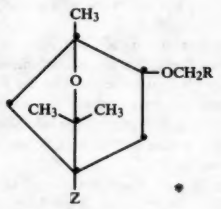
R^6 is H or OH;
R is hydrogen or methyl, and a, b, c, and d represent optional double bonds; or
(b)



wherein R^7 is phenyl or benzyloxy in which the phenyl in each case can be substituted with one or more substituents selected from C_{1-3} alkyl, and halo, and R^8 and R^9 are C_{1-3} alkyl or halo and e represents an optional double bond;
and R^5 is
(a) C_{1-3} alkyl; or
(b) phenyl, either unsubstituted or substituted with one or two C_{1-3} alkyl groups.

4,588,821
2-OXABICYCLO[2.2.1]HEPTAN-6-OL ETHER HERBICIDES
James E. Powell, Ripon, Calif., assignor to Shell Oil Company, Houston, Tex.
Filed Jun. 15, 1984, Ser. No. 621,013
Int. Cl.[4] C07D *311/00*
U.S. Cl. 549—397 **14 Claims**

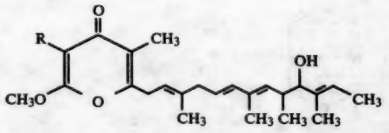
1. A compound of the formula



wherein Z is —C(O)Y in which Y is OR^1 or NR^1R^2 in which R^1 and R^2 each independently is a hydrogen atom, or an alkyl group containing from 1 to 6 carbon atoms; an alkenyl or alkynyl group containing 3 to 4 carbon atoms; an aryl group, aralkyl group or heterocyclic group in which the one or two hetero atoms are N or O, each group containing up to 14 carbon atoms and optionally ring-substituted by one or more halogen atoms or alkyl groups containing 1 to 4 carbon atoms; and R is optionally substituted unsaturated hydrocarbon group containing 2 to 4 carbon atoms, an aromatic group containing up to 14 carbon atoms, heterocyclic group in which the one or two heteroatoms are each selected from O, S or N and containing up to 14 carbon atoms; a cyano group; a cycloalkenyl group containing 5 to 7 carbon atoms; a cycloalkyl group containing 3 to 10 carbon atoms optionally substituted by alkyl of 1 to 3 carbon atoms or a secondary alkyl group containing 3 to 10 carbon atoms; and stereoisomeric form or mixtures thereof.

4,588,822
PHYSIOLOGICALLY ACTIVE SUBSTANCES SS 12538, THEIR PREPARATION AND A NOVEL MICROORGANISM PRODUCING SAME
Junji Oono, Narita; Kenichi Yano, Chiba; Junichi Sato, Narashino; Tadayuki Kouda, Narita; Yoichiro Ogawa, Chiba; Kouichi Yokoi, Kashiwa, and Toshiaki Nakashima, Shisuimachi, all of Japan, assignors to SS Pharmaceutical Co., Ltd., Tokyo, Japan
Filed Apr. 6, 1983, Ser. No. 482,409
Claims priority, application Japan, Apr. 7, 1982, 57-57790; Jun. 18, 1982, 57-104899; Aug. 31, 1982, 57-151496
Int. Cl.[4] C07D *309/32*
U.S. Cl. 549—417 **4 Claims**

1. A physiologically active substance SS 12538 of the following general formula (I)



(I)

in which R represents a hydrogen atom, a methyl group or an ethyl group.

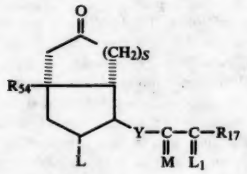
4,588,823

9-SUBSTITUTED CARBACYCLIN ANALOGS

Paul A. Aristoff, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 349,145, Feb. 16, 1982, Pat. No. 4,487,961. This application Sep. 27, 1984, Ser. No. 655,403
Int. Cl.[4] C07C 177/00
U.S. Cl. 549—422 3 Claims

1. A compound of the formula



wherein s is the integer one or 2;

wherein L is H,H; α-OR_{12},β-H; α-H,β-OR_{12}; α-CH_2OR_{12},β-H; α-H,β-CH_2OR_{12} wherein R_{12} is hydrogen or a hydroxyl protective group;

wherein Y is trans —CH=CH—, cis-CH=CH—, $—CH_2CH_2—$, or —C≡C—;

wherein M is α-OR_{12},β-R_{14}; or α-R_{14},β-OR_{12}, wherein R_{12} is as defined above, and R_{14} is hydrogen or methyl; wherein $L_1$is α-R_{15},β-R_{16}; α-R_{16},β-R_{15}; or a mixture thereof wherein R_{15} and R_{16} are hydrogen, methyl, or fluoro being the same or different with the proviso that one of R_{15} and R_{16} is fluoro only when the other of R_{15} and R_{16} is hydrogen or fluoro;

wherein R_{17} is

(1) $—C_mH_{2m}CH_3$ wherein m is an integer of from one to 5,

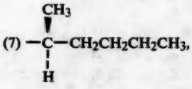
(2) phenoxy optionally substituted by one, 2, or 3 chloro, fluoro, trifluoromethyl, (C_1–C_3)alkyl, or (C_1–C_3)alkoxy, with the proviso that not more than two substituents are other than alkyl and with the proviso that R_{17} is phenoxy or substituted phenoxy, only when R_{15} and R_{16} are hydrogen or methyl, being the same or different;

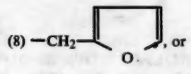
(3) phenyl, benzyl, phenylethyl, or phenylpropyl optionally substituted on the aromatic ring by one, 2, or 3 chloro, fluoro, trifluoromethyl (C_1–C_3)alkyl, or (C_1–C_3)alkoxy, with the proviso that not more than two substituents are other than alkyl,

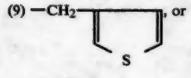
(4) cis-CH=CH—CH_2CH_3,

(5) $—(CH_2)_2—CH(OH)—CH_3$,

(6) $—(CH_2)_3—CH=C(CH_3)_2$,





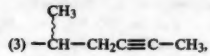


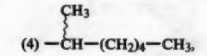
wherein

taken together is

(1) (C_4–C_7)cycloalkyl optionally substituted by one to 3 (C_1–C_5)alkyl,

(2) 3-thienyloxymethyl,





(5) $—C≡C—C_qH_{2q}CH_3$ wherein q is an integer of from 2 to 6, or

(6) $—C_pH_{2p}CH=CH_2$ wherein p is an integer of from 3 to 7; and individual optical isomers thereof;

and wherein R_{54} is —CN; —CH=CH_2; —CH_2OH; —C≡CH; —C≡CCF_3; $—C≡CC_nH_{2n}CH_3$ wherein n is zero, one, 2 or 3; cis-CH=$CHC_nH_{2n}CH_3$, trans-CH=$CHC_nH_{2n}CH_3$ wherein n is zero, one, 2 or 3; —C≡C—C≡C—R_1 wherein R_1 is hydrogen, methyl or ethyl; —C≡C—OR_2 wherein R_2 is methyl or ethyl; or CH_2X wherein X is bromo or chloro.

4,588,824

PREPARATION OF EPIHALOHYDRIN ENANTIOMERS

John J. Baldwin, Gwynedd Valley, and David E. McClure, Lansdale, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 369,724, Apr. 19, 1982, Pat. No. 4,408,063, which is a continuation-in-part of Ser. No. 176,236, Aug. 8, 1980, abandoned, which is a continuation of Ser. No. 940,681, Sep. 8, 1978, abandoned, which is a continuation-in-part of Ser. No. 919,590, Jun. 27, 1978, abandoned. This application Jun. 16, 1983, Ser. No. 505,041
Int. Cl.[4] C07D 317/00
U.S. Cl. 549—453 4 Claims

1. A process for preparing (S)-glycerol-1,2-acetonide which comprises:

(a) treating 1,2:5,6-di-O-isopropylidine-D-mannitol with lead tetraacetate in an aprotic solvent,

(b) reducing the reaction product from (a) with an alkali metal borohydride and

(c) treating the reaction mixture containing the reduced product with an ammonium halide to obtain said (S)-glycerol derivative.

4,588,825

INTERMEDIATES FOR THE SYNTHESIS OF 4-AMINO-4,5-DIHYDRO-2-FURANCARBOXYLIC ACID

Joseph P. Burkhart, West Chester, and Gene W. Holbert, Loveland, both of Ohio, assignors to Merrell Dow Pharmaceutics Inc., Cincinnati, Ohio

Continuation of Ser. No. 540,745, Oct. 11, 1983, abandoned. This application Mar. 13, 1985, Ser. No. 712,318
Int. Cl.[4] C07D 307/24, 307/30; C07F 7/18
U.S. Cl. 549—475 5 Claims

1. Compounds of the group consisting of;

1,1-Dimethyl-[1-[[(1,1-dimethylethyl)silyl]oxy]methyl]-4-methoxy-4-[(trimethylsilyl)oxy]-3-butenyl[carbamate;

Methyl 4-[[(1,1-dimethylethoxy)carbonyl]amino]-5-[[(1,1dimethylethyl dimethylsily]oxy]-2-hydroxypentanoate;

Methyl 4-[[(1,1-dimethylethoxy carbonyl]amino-5-[[(1,1-dimethylethyldimethylsilyl]oxy]2-oxopentanoate;

Methyl 4-[[(1,1-dimethylethoxy carbonyl]amino]tetrahydro-2-hydroxy-2-furancarboxylate;

Methyl 4-[[(1,1-dimethylethoxy)carbonyl]amino]-4,5-dihydro-2-furancarboxylate; and

4-[[(1,1-dimethylethoxy)carbonyl]amino]-4,5-dihydro-2-furancarboxylic acid.

4,588,826

ETHANEDIIMIDAMIDE INTERMEDIATES

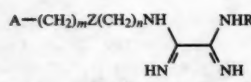
Ronnie R. Crenshaw, Dewitt, and Aldo A. Algieri, Fayetteville, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 600,864, Apr. 16, 1984, Pat. No. 4,517,366, which is a division of Ser. No. 473,791, Mar. 16, 1983, Pat. No. 4,528,377, which is a continuation-in-part of Ser. No. 363,207, Mar. 29, 1982, abandoned. This application Dec. 3, 1984, Ser. No. 677,619

Int. Cl.[4] C07D *307/52*

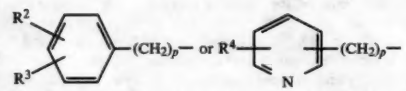
U.S. Cl. 349—491 4 Claims

1. A compound of the formula



II

wherein R^1 is hydrogen, (lower)alkyl, 2-fluoroethyl, 2,2,2-trifluoroethyl, allyl, propargyl,



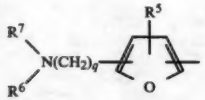
in which p is 1 or 2, R^2 and R^3 each are independently hydrogen, (lower)alkyl, (lower)alkoxy or halogen, and, when R^2 is hydrogen, R^3 also may be trifluoromethyl, or R^2 and R^3, taken together, may be methylenedioxy, and R^4 is hydrogen, (lower)alkyl or (lower)alkoxy;

m is an integer of from 0 to 2 inclusive;

n is an integer of from 2 to 5 inclusive;

Z is oxygen, sulfur or methylene; and

A is



in which R^5 is hydrogen, (lower)alkyl or (lower)alkoxy, q is an integer of from 1 to 4 inclusive and R^6 and R^7 each are independently (lower)alkyl, (lower)alkoxy(lower)alkyl in which the (lower)alkoxy moiety is at least two carbon atoms removed from the nitrogen atom, or phenyl(lower-)alkyl, and, when R^6 is hydrogen, R^7 also may be cyclo(-lower)alkyl, or R^6 and R^7, taken together with the nitrogen atom to which they are attached, may be pyrrolidino, methylpyrrolidino, dimethylpyrrolidino, morpholino, thiomorpholino, piperidino, methylpiperidino, dimethylpiperidino, N-methylpiperazino, 1,2,3,6-tetrahydropyridyl, homopiperidino, heptamethyleneimino, octamethyleneimino, 3-azabicyclo[3.2.2]non-3-yl or 3-pyrrolino; or a salt, hydrate or solvate thereof.

4. The compound of claim 1 which is N-{2-[(5-dimethylaminomethyl-2-furyl)methylthio]ethyl}ethanediimidamide, or a salt, hydrate or solvate thereof.

4,588,827

PREPARATION OF TETRAHYDROFURAN

Herbert Mueller, Frankenthal, and Christof Palm, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 21, 1985, Ser. No. 703,770

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1984, 3406471; Sep. 5, 1984, 3432575

Int. Cl.[4] C07D *307/08*

U.S. Cl. 549—509 8 Claims

1. A process for the preparation of tetrahydrofuran from an aqueous solution of butane-1,4-diol by eliminating water in the liquid phase at elevated temperatures, under superatmospheric pressure and in the presence of an acid, wherein a crude alkaline aqueous solution of butane-1,4-diol, obtained by reaction of acetylene with aqueous formaldehyde and catalytic hydrogenation of the resulting but-2-yne-1,4-diol solution, is, neutralized with sulfuric acid, and is then acidified by adding phosphoric acid and heated at from 200° to 260° C. under superatmospheric pressure.

4,588,828

ACETYLENIC ANTIBIOTICS

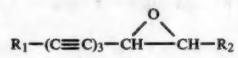
Gregory S. Bisacchi, Neshanic, and William H. Koster, East Amwell Township, Macomb County, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Aug. 23, 1984, Ser. No. 643,592

Int. Cl.[4] C07D *303/32, 303/14*

U.S. Cl. 549—548 12 Claims

1. A compound having the formula



wherein R_1 is phenyl or phenyl substituted with 1, 2 or 3 halogen, alkyl of 1 to 4 carbons, alkoxy of 1 to 4 carbons, or trifluoromethyl groups, and R_2 is hydroxymethyl, carboxyaldeyde, propenalyl, 3-hydroxy-1-propenyl or 3-hydroxy-1,2-epoxypropyl.

4,588,829

(DISULFIDO)TRIS(N,N-SUBSTITUTED DITHIOCARBAMATO)MO(V) COMPLEXES

Wie-Hin Pan, Columbia, Md., and Edward I. Stiefel, Bridgewater, N.J., assignors to Exxon Research & Engineering Company, Florham Park, N.J.

Filed Jul. 27, 1984, Ser. No. 635,283

Int. Cl.[4] C07F *11/00*

U.S. Cl. 556—38 12 Claims

1. Mononuclear, eight-coordinate, neutral (disulfido)-tris(N,N-substituted dithiocarbamato)Mo(V) complexes containing only eight sulfur atoms in the Mo coordination sphere.

4,588,830

ADDITION POLYMERIZABLE ADDUCTS FOR NONAQUEOUS DISPERSIONS

Thomas E. Fisk, and Dwight K. Hoffman, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 9, 1982, Ser. No. 448,082

Int. Cl.[4] C07F *7/28*

U.S. Cl. 556—52 6 Claims

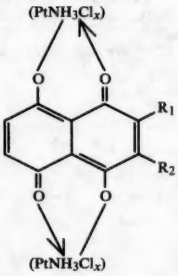
1. An ethylenic addition polymerizable adduct comprising an ethylenically unsaturated moiety bound through a heteroatomic moiety to at least one lyophilic moiety wherein said adduct in polymerized form is capable of stabilizing a dispersion of a lyophobic polymer in a continuous nonaqueous liquid phase, said lyophilic moiety being the residue of a polyahl having a Mn of at least 200.

4,588,831
PLATINUM COMPLEX COMPOUNDS OF SUBSTITUTED 5,8-DIHYDROXYL-1,4-NAPHTHOQUINONE, AND PROCESS FOR THEIR PRODUCTION AND USE

Angelos N. Sagredos, Hamburg, Fed. Rep. of Germany; Vassilios P. Papageorgiou, Panorama/Thessaloniki, and Antonius S. Mellidis, Salonica, both of Greece, assignors to NATEC, Fed. Rep. of Germany

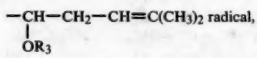
Filed Nov. 9, 1984, Ser. No. 669,965
Int. Cl.[4] C07F *15/00*
U.S. Cl. 556—137 **6 Claims**

1. Platinum complex compounds of the general formula:

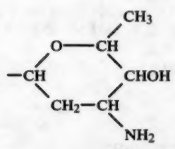


(I)

wherein R_1 and R_2 can be identical or different, and represent an alkyl radical with 1 to 18 carbon atoms, or either R_1 or R_2 represent a hydrogen atom or R_2 or R_1 represents an alkyl radical with 1 to 18 carbon atoms, and



wherein R_3 is a hydrogen atom or the:



radical or an acyl radical, and x=1 or 2.

4,588,832
METHOD FOR THE PREPARATION OF A 1-ALKYNYLSILYL COMPOUND

Toshinobu Ishihara; Akira Yamamoto, and Minoru Takamizawa, all of Niigata, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Dec. 17, 1984, Ser. No. 682,267
Claims priority, application Japan, Dec. 16, 1983, 58-237520
Int. Cl.[4] C07F *7/08*
U.S. Cl. 556—478 **9 Claims**

1. A method for the preparation of a 1-alkynylsilyl compound which comprises the steps of:

(a) reacting a hydrocarbyl-substituted acetylene compound represented by the general formula $R^1C{\equiv}CH$, in which R^1 is a monovalent hydrocarbon group, or a substituted or unsubstituted allene compound represented by the general formula $R^2CH{=}C{=}CH_2$, in which R^2 is a hydrogen atom or a monovalent hydrocarbon group, with metallic sodium in an inert organic solvent to form a substituted sodium acetylide in the reaction mixture;

(b) admixing the reaction mixture with an organic polar solvent; and

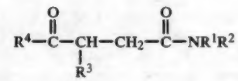
(c) admixing the reaction mixture with a trihydrocarbyl monohalogenosilane represented by the general formula R_3SiX, in which X is a halogen atom and R is a substituted or unsubstituted monovalent hydrocarbon group each independent from the others.

4,588,833
PROCESS FOR THE PREPARATION OF SUBSTITUTED SUCCINIC ACID AMIDES

Jürgen Kadelka, and Hans-Helmut Schwarz, both of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 26, 1984, Ser. No. 665,226
Claims priority, application Fed. Rep. of Germany, Oct. 29, 1983, 3339386; May 30, 1984, 3420112
Int. Cl.[4] C07C *102/00*
U.S. Cl. 560—145 **20 Claims**

1. A process for the preparation of a substituted succinic acid amide of the formula



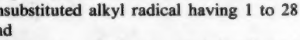
wherein

R^1 and R^2 can be identical or different and represent hydrogen, an alkyl or cycloalkyl radical having 1 to 20 carbon atoms or an aralkyl radical having 7 to 20 carbon atoms or an aryl radical having 6 to 14 carbon atoms, the alkyl, cycloalkyl, aralkyl or aryl radical concerned being optionally monosubstituted or polysubtituted by an alkyl and/or alkoxy group having 1 to 6 carbon atoms and/or by fluorine, chlorine, bromine and/or iodine and/or by an alkyl and/or alkoxy group which has 1 to 6 carbon atoms and is monosubtituted or polysubstituted by fluorine, chlorine, bromine and/or iodine,

R^3 represents an unbranched or branched, substituted or unsubstituted alkyl radical having 1 to 28 carbon atoms and

R^4 represents $—OR^5$ and $—NR^5R^6$, R^5 and R^6 being identical or different and having the meaning indicated for R^1 and R^2,

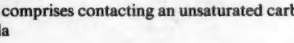
which comprises contacting an unsaturated carboxamide of the formula



wherein

R^1 and R^2 have the meaning indicated above and R^7 represents and α,β-unsaturated or β,γ-unsaturated, unbranched or branched, substituted or unsubstituted alkyl radical having 3 to 30 carbon atoms,

with an H-acid nucleophilic compound of the formula



wherein

X represents $—OR^5$ and $—NR^5R^6$ and

R^5 and R^6 have the above-mentioned meaning, with carbo monoxide in the presence of a cobalt compound.

4,588,834

PROCESS FOR CARBONYLATION OF OLEFINS TO CARBOXYLIC ACIDS AND ESTERS

John M. Larkin, Austin, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Oct. 4, 1984, Ser. No. 657,565
Int. Cl.[4] C07C 67/38
U.S. Cl. 560—233 17 Claims

1. A process for the continuous production of esters of carboxylic acids which comprises passing a liquid feed consisting of propylene, a promoter selected from the group consisting of halides and heterocyclic aromatic amines and a Group VIII soluble metal catalyst selected from the group consisting of compounds of ruthenium, nickel and cobalt and a protonic coreactant from the group consisting of alcohols and water, wherein the metal catalyst concentration ranges from 1 ppm to greater than 1000 ppm, optionally in the presence of a solvent and a gas comprising carbon monoxide over a carbon bed maintained at a temperature of 225°–350° C. and a pressure of from about 500 psi to 4000 psi.

14. A process for the continuous production of acids and esters which comprises passing liquid feed consisting of a an olefin, a halide promoter, a protonic coreactant from the group consisting of alcohols and water and a soluble Group VIII metal catalyst, wherein, the metal catalyst concentration ranges from 1 ppm to greater than 1000 ppm optionally in the presence of a solvent and a gas comprising carbon monoxide over a carbon bed maintained at a temperature of 225° C. to 350° C. and a pressure of from about 500 psi to 4000 psi.

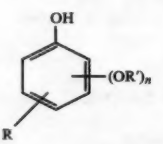
4,588,835

PROCESS FOR PREPARING ALKOXYPHENOLS

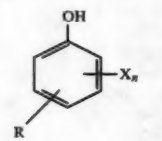
Sigeru Torii; Hideo Tanaka, both of Okayama, and Mitsuo Akada, Naruto, all of Japan, assignors to Otsuka Kagaku Yakuhin Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 362,890, Mar. 29, 1982, abandoned, which is a continuation-in-part of Ser. No. 132,991, Mar. 24, 1980, abandoned. This application Oct. 19, 1984, Ser. No. 662,542
Int. Cl.[4] C07C 41/16, 45/64, 67/28
U.S. Cl. 560—254 5 Claims

1. A process for preparing an alkoxyphenol represented by the formula:



wherein R is hydrogen, alkyl having 1 to 4 carbon atoms, formyl, hydroxymethyl, alkoxymethyl, dialkoxymethyl, acetoxymethyl or diacetoxymethyl, R' is alkyl having 1 to 4 carbon atoms, and n is an integer of 1 to 5; characterized in that a phenol halide represented by the formula:



wherein R and n are as defined above, and X is chlorine or bromine is reacted, in the presence of a copper salt serving as a catalyst and a solvent, with a reaction product; wherein the reaction product is prepared by heating at reflux temperature of the solvent, in the presence of calcium oxide, 1 to 20 moles of an alkali metal hydroxide, per mole of the phenol halide, and 1 to 50 moles of a compound of the formula R'OH wherein R' is as defined above, per mole of the alkali metal hydroxide.

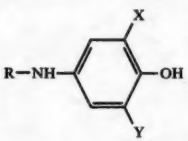
4,588,836

NOVEL SYNTHETIC SUBSTRATE AND ASSAY METHOD USING THE SAME

Kunio Matsumoto; Yoshitaka Kagimoto; Tsutomu Hirata; Susumu Watanabe, all of Shizuoka; Akira Ohtsuka, Kanagawa, and Kiyoharu Takahashi, Saitama, all of Japan, assignors to Toyo Jozo Kabushiki Kaisha, Shizuoka and Kokusan Chemical Works Limited, Tokyo, both of, Japan

Filed Aug. 24, 1983, Ser. No. 526,031
Claims priority, application Japan, Sep. 1, 1982, 57-150701; Nov. 15, 1982, 57-198862
Int. Cl.[4] C07C 101/72; C12Q 1/48
U.S. Cl. 562—448 7 Claims

1. A compound of the formula



wherein R is L-leucyl or γ-L-glutamyl and X and Y are halogen and are the same or different, or a salt thereof.

4,588,837

PROCESS FOR THE PREPARATION OF FLUOROCARBOXYLIC ACIDS

Bernd Baasner, Leverkusen; Erich Klauke, Odenthal, and Reinhard Lantzsch, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 18, 1984, Ser. No. 632,135
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1983, 3326210
Int. Cl.[4] C07C 51/097, 53/18
U.S. Cl. 562—605 1 Claim

1. A process for the preparation of trifluoroacetic acid which comprises introducing at 130° to 200° C. and at normal pressure 2,2,2-trifluoronitroethane into a sulfuric or phosphoric acid which contains 2 to 20% by weight of water, said introducing of the 2,2,2-trifluoronitroethane being at a rate corresponding to the rate of production of said trifluoroacetic acid and continuously removing the trifluoroacetic acid from the reaction mixture by distillation.

4,588,838

DIUREA AND DIGUANIDINE PHOSPHINATES AND PHOSPHONATES

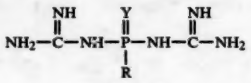
Norman R. Byrd, Villa Park, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Division of Ser. No. 317,162, Nov. 2, 1981, Pat. No. 4,405,427. This application May 27, 1983, Ser. No. 498,986
Int. Cl.[4] C07F 9/22, 9/44
U.S. Cl. 564—14 7 Claims

1. The 2:1 molar adducts of two moles of guanidine to one mole of a phosphorus-containing compound selected from the group consisting of dimethyl phosphite and dimethyl methyl phosphonate.

2. Compounds having the formula

(d)



where Y is O or S; and R is selected from the group consisting of H, alkyl containing from about 1 to 6 carbon atoms, cycloalkyl containing from about 5 to about 7 carbon atoms, aryl containing from about 6 to about 14 carbon atoms, the corresponding halogenated alkyl and aryl groups, nitroaryl containing about 6 to about 14 carbon atoms, heterocyclic containing 5 to 6 members in the heterocyclic nucleus, and O, N or S as hetero atoms, amino, alkylamino containing from about 1 to about 8 carbon atoms in the alkyl group, and arylamino containing from about 6 to about 14 carbon atoms.

4,588,839

SULPHONAMIDES DERIVED FROM 3-BENZYLIDENE-CAMPHOR AND THEIR APPLICATION AS UV FILTERS

Gérard Lang, Saint-Gratien; Alain Malaval, Aulnay-sous-Bois, and Gérard Malle, Tremblay-les-Gonesses, all of France, assignors to L'Oreal, Paris, France

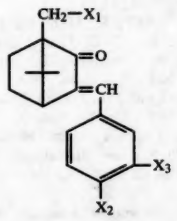
Filed Jul. 7, 1983, Ser. No. 511,646

Claims priority, application Luxembourg, Jul. 8, 1982, 84264

Int. Cl.⁴ C07C *143/78*; C07D *303/08*; A61K *7/42*; A61L *23/00*

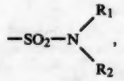
U.S. Cl. 564—84 **17 Claims**

1. A sulphonamide compound having the general formula:

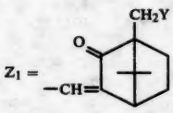


(I)

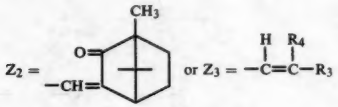
in which X_1 denotes a hydrogen atom or the radical Y; X_2 denotes a hydrogen or halogen atom, a C_1–C_4 alkyl or alkoxy radical or a radical Y or Z; X_3 denotes a hydrogen or halogen atom, a C_1–C_4 alkyl or alkoxy radical or a radical Y or Z; or alternatively X_2 and X_3 together form an alkylenedioxy group containing 1 or 2 carbon atoms; Y denotes the radical



in which R_1 denotes a hydrogen atom or a C_1–C_4 alkyl or hydroxyalkyl radical; R_2 denotes a hydrogen atom, or a linear or branched alkyl, alkenyl, cycloalkyl, aryl or aralkyl radical, said radical containing 1 to 20 carbon atoms and it being possible for it to be substituted by one or more hydroxyl, alkoxy or dialkylamino groups, with the proviso that R_1 and R_2 do not simultaneously denote a hydrogen atom; and Z denotes a group;



in which Y is as defined above or



in which R_3 denotes a hydrogen atom or a radical —CN or —COR_5 and R_4 denotes a radical —COR_6, in which radicals R_5 and R_6, which are identical or different, denote C_1–C_{20} alkoxy or alkylamino groups, with the proviso that one of the symbols X_1, X_2 and X_3 is different from the other two and that

(a) if X_1 denotes a hydrogen atom, X_2 and X_3 are different from one another and are not Z_2 or Z_3, one of the two necessarily being Y or Z_1, or

(b) if X_1 is Y, X_2 and X_3 are different from Y and are not simultaneously Z_1 or Z_2 or Z_3.

4,588,840

OXYALKYLENE AROMATIC AMINES

Arthur E. Gurgiolo, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

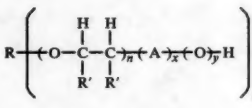
Continuation-in-part of Ser. No. 371,765, Apr. 26, 1982, abandoned. This application Sep. 27, 1984, Ser. No. 654,717

Int. Cl.⁴ C07C *87/50*

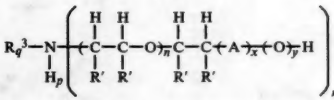
U.S. Cl. 564—443 **8 Claims**

1. Aromatic amines represented by the general formulas

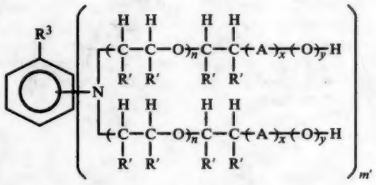
I.



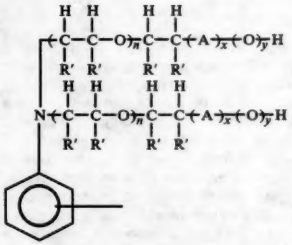
II.



III.



IV.



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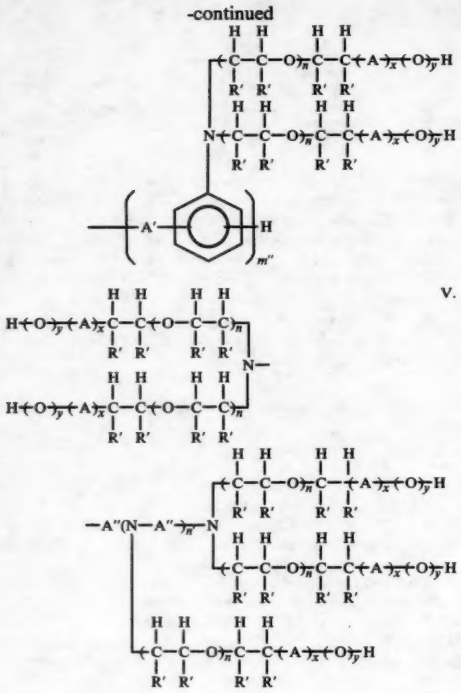


V.

wherein A is a divalent group represented by the formula

A′ is a divalent aliphatic hydrocarbyl group having from 1 to about 10 carbon atoms; A″ is a divalent aliphatic hydrocarbyl group having from 2 to about 10 carbon atoms; R is the residue which would result from the removal of the hydroxyl group(s) from a hydroxyl-containing compound having from 1 to about 8 hydroxyl groups per molecule; each R′ is independently hydrogen, methyl, ethyl, propyl, butyl or phenyl with the proviso that within each

group, at least one R′ is hydrogen; each R″ is independently hydrogen, a halo group, a hydrocarbon or a hydrocarbyloxy group having from 1 to about 8 carbon atoms; R^3 is a hydrocarbon group having from 1 to about 8 carbon atoms; m has a value corresponding to the number of hydroxyl groups present in said hydroxyl-containing compound; m′ has a value of 1 or 2; m″ has an average value of from 1 to about 6; n has a value of from about one to about 200; n′ has a value from zero to about 5; q is one or two provided that q plus m′ does not exceed three; p has a value equal to 3 minus the sum of m′ plus q; each x is independently zero or 1 with the proviso that within each formula at least one x has a value of 1; and y has a value of 1 when x is zero and a value of zero when x is 1.

4,588,841

PROCESS FOR THE PREPARATION OF AMINOPHENOLS

Guy Morellet; Jean-Claude Jacquesy, and Marie-Paule Jouannetaud, all of Poitiers, France, assignors to Atochem, France

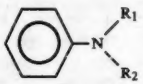
Filed Jun. 13, 1984, Ser. No. 620,033

Claims priority, application France, Jun. 29, 1983, 83 10730

Int. Cl.⁴ C07C *91/42*

U.S. Cl. 564—443 **5 Claims**

1. Process for the preparation of aminophenols with an increased proportion of the meta isomer thereof comprising reacting hydrogen peroxide in a superacid liquid medium with an aromatic amine of the formula:



in which R_1 and R_2 represent either a hydrogen atom or a C_1–C_8 alkyl radical at a temperature of from about −50° C. to 0° C. for a time sufficient to form the aminophenols.

4,588,842

CATALYTIC PREPARATION OF LINEAR POLYETHYLENEPOLYAMINES

Steven H. Vanderpool, New Braunfels, Tex., assignor to Texaco Inc., White Plains, N.Y.

Division of Ser. No. 455,160, Jan. 3, 1983. This application Dec. 22, 1983, Ser. No. 564,153

The portion of the term of this patent subsequent to Mar. 25, 2003, has been disclaimed.

Int. Cl.⁴ C07C *85/06*

U.S. Cl. 564—479 **8 Claims**

1. In a method wherein monoethanolamine is reacted with ethylenediamine in a reaction zone in the presence of a phosphorus containing catalyst to provide an essentially noncyclic product comprising polyethylenepolyamines, the improvement for conducting said process on a continuous basis which comprises:

a. using, as a catalyst, a thermally activated pelleted group IVb metal oxide having about 0.5 to about 10 wt. % of phosphorus thermally chemically bonded to at least the surface thereof,

b. continuously contacting a mixture of ethylenediamine and monoethanolamine in a molar ratio of about 1 to 5 moles of ethylenediamine per mole of monoethanolamine with said pelleted catalyst at a temperature of about 250° to about 400° C. and a pressure of about 500 to about 3000 psig. to obtain an essentially noncyclic reaction product.

4,588,843

SYNTHESIS OF (ALKOXYALKYL) AMINES

Everett M. Marlett, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Apr. 26, 1984, Ser. No. 603,966

Int. Cl.⁴ C07C *93/04*

U.S. Cl. 564—508 **13 Claims**

1. A process which comprises reacting an alkanolamine with an alkali metal oxide or hydroxide base and thereafter reacting an alkyl halide with the product so formed so that an (alkoxyalkyl)amine is formed.

4,588,844

PROCESS FOR PREPARING AROMATIC ALDEHYDES

Ernst Kysela, Bergisch-Gladbach, and Erich Klauke, Odenthal, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 1, 1984, Ser. No. 575,962

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1983, 3304202

Int. Cl.[4] C07C *47/565, 45/42*

U.S. Cl. 568—41 14 Claims

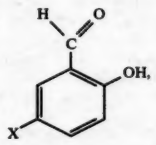
1. In the process for formylating an aromatic compound to prepare the corresponding aromatic aldehyde which process comprises contacting said aromatic compound with urotropine in the presence of an acid reaction partner at an elevated temperature and under elevated pressure and to hydrolyze the reaction product formed, wherein the improvement comprises

(a) said aromatic compound being selected from the group consisting of trifluoromethoxybenzene, 4-fluorotoluene, fluorobenzene, 2-methyltrifluoromethylbenzsene, 4-trifluoromethoxyphenol, trifluoromethylthiobenzene, 4-trifluoromethylthiophenol and chlorobenzene; and

(b) said acid reaction partner being hydrogen fluoride, said hydrogen fluoride being in an amount of 10 to 100 mol of hydrogen fluoride per mol of said aromatic compound,

and subsequently working up the reaction mixture in water.

14. An aromatic aldehyde of the formula



wherein x denotes trifluoromethylthio.

4,588,845

OXIDATION OF UNSATURATED ORGANIC COMPOUNDS WITH HYDROGEN PEROXIDE

Randy A. Bull, Hopewell, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 514,748, Jul. 18, 1983. This application May 25, 1984, Ser. No. 613,982

Int. Cl.[4] C07C *37/60*

U.S. Cl. 568—771 14 Claims

1. A process for oxidizing an arene comprising contacting the arene with hydrogen peroxide in the presence of a strong-acid type cation exchange polymer wherein at least part of the cations are simple or complex cations of a transition metal.

4,588,846

PROCESS FOR PRODUCING CYCLIC ALCOHOL

Osamu Mitsui, and Yohei Fukuoka, both of Okayama, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

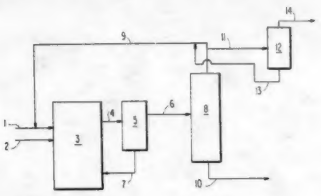
Filed Nov. 9, 1984, Ser. No. 669,976

Claims priority, application Japan, Nov. 9, 1983, 58-209150; Nov. 9, 1983, 58-209148

Int. Cl.[4] C07C *35/08*

U.S. Cl. 568—835 17 Claims

1. A process for producing a cyclohexanol by catalytic hydration of cyclohexene in a liquid phase, which comprises using as a catalyst a zeolite having a population ratio of acid sites on the external surface to total acid sites of 0.07/1 or more, conducting the hydration reaction in a reaction zone in the co-presence of an oil phase mainly containing the cyclohexene and an aqueous phase mainly containing water and the catalyst while controlling the cyclohexanol produced so that the concentration thereof in the oil phase is more than that in the aqueous phase, and separating and recovering the cyclohexanol produced from the oil phase, wherein the reaction is conducted at from 50° to 250° C.



4,588,847

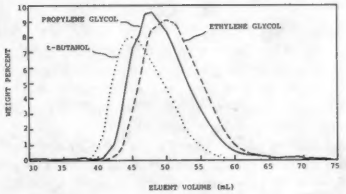
PROCESS FOR SEPARATION OF ETHYLENE GLYCOL AND PROPYLENE GLYCOL ON SELECTED ZEOLITES

Yu-Chia T. Chou, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 26, 1985, Ser. No. 748,938

Int. Cl.[4] C07C *29/76, 31/20*

U.S. Cl. 568—872 7 Claims



1. A process for liquid-phase separation of ethylene glycol from a feed mixture comprising ethylene glycol and propylene glycol, comprising the steps of:

(a) contacting the mixture with an adsorbent comprising at least one aluminosilicate selected from the group consisting of X zeolite, Y zeolite, and A zeolite, at a temperature of from about 20 C. to about 150° C. and at a pressure sufficient to maintain components of the mixture in a liquid phase, whereby ethylene glycol is adsorbed on the adsorbent; and

(b) recovering adsorbed ethylene glycol by contacting the adsorbent with a desorbent.

4,588,848

SYNTHESIS OF NEOALKANOLS

Stephen A. Butter, Allentown, and Ilse Stoll, Bethlehem, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

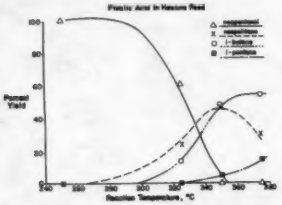
Filed Nov. 1, 1984, Ser. No. 667,047

Int. Cl.[4] C07C *29/136, 31/125*

U.S. Cl. 568—885 10 Claims

1. In a process for the synthesis of a neoalcohol of the formula $R_1R_2R_3CCH_2OH$ by hydrogenation of a neoacid of the formula $R_1R_2R_3CCOOH$, wherein R_1, R_2 and R_3 are the same or different alkyl of 1–10 carbom atoms in the presence of a hydrogenation catalyst and hydrogen, the improvement which comprises hydrogenating said neoacid at a temperature from about 225° C. to about 325° C., a hydrogen flow rate of 1500 to 6000 ml/g catalyst/hr., a neoacid feed rate of 1.6 to 20 mM/g catalyst/hr. and a hydrogen pressure of 10 to 100 Kg/cm^2 over a copper oxide/zinc oxide catalyst comprising 80 to 95% by

wt. of copper oxide/zinc oxide in an 8:1 to 1:1 weight ratio and 20 to 5% by weight alumina to obtain substantially complete



conversion of the neoacid and at least 60 mol % yield of the corresponding neoalcohol.

4,588,849

PROCESS FOR THE PREPARATION OF AN ISOMERIC MIXTURE OF 1-(2,6,6-TRIMETHYLCYCLOHEXYL)-HEXAN-3-OL

Karl-Heinrich Schulte-Elte, Onex, Switzerland, assignor to Firmenich SA, Geneva, Switzerland

Filed Feb. 28, 1984, Ser. No. 584,500

Claims priority, application Switzerland, Mar. 11, 1983, 1340/83

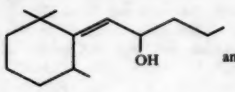
Int. Cl.[4] **C07C** *35/08*

U.S. Cl. 568—834 **4 Claims**

1. A process for the preparation of a composition containing not less than about 60% by weight of trans-1-(2,6,6-trimethylcyclohexyl)-hexan-3-ol and not more than about 40% by weight of cis-1-(2,6,6-trimethylcyclohexyl)-hexan-3-ol, which comprises the following sequential steps:

a. the addition of hex-1-yn-3-ol to 2,6,6-trimethylcyclohexanone in the presence of an alkali metal alkoxide or hydroxide to give 1-(1-hydroxy-2,6,6-trimethylcyclohexyl)-hex-1-yn-3-ol;

b. the reduction of said hexynol by means of an alkali metal aluminohydride to give an allenic carbinol of formula



(II)

and

c. the catalytic hydrogenation of said carbinol wherein hydrogen is added at a pressure higher than the atmospheric pressure and in the presence of Raney-nickel and copper chromite.

4,588,850

PROCESS FOR THE PRODUCTION OF ACETYLENE AND SYNTHESIS OR REDUCTION GAS FROM COAL IN AN ELECTRIC ARC PROCESS

Richard Mueller, Marl; Lothar Kerker, Dülmen, and Cornelius Peuckert, Dinslaken, all of Fed. Rep. of Germany, assignors to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Aug. 27, 1984, Ser. No. 644,420

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1983, 3330750

Int. Cl.[4] **C07C** *4/02, 5/35*

U.S. Cl. 585—539 **18 Claims**

1. A process for the manufacture of acetylene and a synthesis or reduction gas based on hydrogen and carbon monoxide, comprising pyrolyzing powdered coal in a first electric arc-plasma reactor operating at an energy density of 1 to 5 kWh/Nm^3, with a residence period of 0.5 to 10 msec and at a temperature of at least 1500° C., whereby the amount of the resultant gaseous compounds obtained from the coal in the pyrolysis reaction does not exceed 1.8 times the volatile content of the coal;

passing quenched coke remaining after the pyrolysis step into a second electric arc-plasma reactor in which the coke is converted into said synthesis or reduction gas by means of a gasifying medium, under a residence time of 1 to 15 sec and a temperature of at least 800° C.;

the gas obtained in the pyrolysis stage containing acetylene and the gas obtained in the gasification stage containing H_2 and CO and constituting a synthesis or reduction gas.

4,588,851

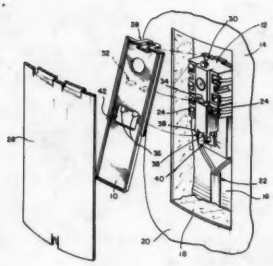
THERMOSTAT COVER

Donald R. Turner, Shelbyville, Ind., assignor to Williams Industries, Inc., Shelbyville, Ind.

Continuation-in-part of Ser. No. 579,014, Feb. 10, 1984, Pat. No. 4,543,445. This application May 28, 1985, Ser. No. 737,717

Int. Cl.[4] H02B *1/14;* H01R *13/44;* H05K *5/03*

U.S. Cl. 174—5 R 19 Claims



2. A quick assembly protective shield for a front surface of an electrical control device, the device being responsive to the temperature of an apparatus secured to a back surface of the device, the device including on the front surface electrical terminals for receiving wires from the apparatus and a temperature adjusting means for adjusting the temperature at which the device operates to control the apparatus, the device including a first lug on a top surface and a laterally spaced pair of lugs on a lower surface adjacent the temperature adjusting means, the lugs each including a back facing surface, the protective shield comprising a substantially planar body for covering the front surface of the device including the electrical terminals, the body having an aperture for alignment with the temperature adjusting means, a top retaining means on a top edge of the body for projecting toward the back surface of the device having an opening defined in part by a first engaging surface for engaging the back facing surface of the first lug, the first engaging surface including a step defined by first and second front facing surfaces separated by a top facing surface, and a pair of spaced inwardly facing catches situated within the aperture and for projecting toward surface of the device for engaging the laterally spaced pair of lugs, the catches including inclined back facing surfaces for contacting front outer surfaces of the laterally spaced pair of lugs during assembly to deflect the catches so as to assure quick assembly of the shield to the electrical control device.

4,588,852

STABLE IMPEDANCE RIBBON COAX CABLE

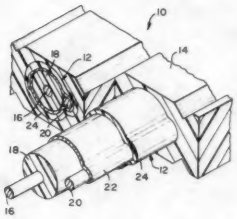
James R. Fetterolf, Mechanicsburg, and Jeffrey K. Fisher, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 21, 1984, Ser. No. 684,527

Int. Cl.[4] H01B *7/34*

U.S. Cl. 174—36 14 Claims

1. A ribbon coaxial cable comprised of elongated and conductive drain conductors, elongated and conductive center conductors parallel with respective drain conductors, each center conductor being surrounded concentrically by a separate corresponding dielectric sheath, each said dielectric sheath and a corresponding drain conductor being mutually engaged along their corresponding lengths and together encircled by a separate corresponding conductive outer conductor,



and a dielectric jacket containing the outer conductors, the improvement comprising, elastic means surrounding each outer conductor for urging each outer conductor in continuous engagement with a corresponding drain conductor, and said dielectric jacket surrounding said elastic means.

4,588,853

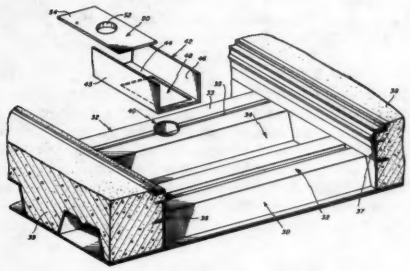
ELECTRICAL TRENCH GROMMET MEMBER

Merle A. Confer, Ayer, Mass., assignor to Roll Form Products, Inc., Boston, Mass.

Filed Jun. 21, 1984, Ser. No. 622,776

Int. Cl.[4] H02G *3/28*

U.S. Cl. 174—48 12 Claims



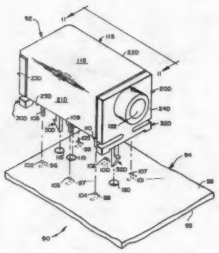
1. An electrical trench grommet member in combination with and coupling between a corrugated metal decking having alternating crests and troughs and an electrical trench adapted to extend transversely of the decking crests and troughs, said decking having a hole in a crest thereof, said electrical trench having a hole in the bottom wall thereof larger than the decking hole and adapted to have the trench hole periphery overlay the decking hole, said grommet member having a grommet piece adapted to interlock with the decking hole and of comparable size to the decking hole to engage therewith, and an overlay piece integral with said grommet piece and extending peripherally therefrom to cover the larger trench hole.

4,588,854

PANEL MOUNTABLE MODULE HOUSING

James R. Bailey, Chicago, and Eric L. Long, Northbrook, both of Ill., assignors to Switchcraft, Inc., Chicago, Ill.

Filed Mar. 2, 1983, Ser. No. 471,402
Int. Cl.[4] H05K *5/00*
U.S. Cl. 174—52 R 16 Claims



1. A housing for mounting on a panel and comprising:

resilient support means extended from said housing for resilient pressure engagement with an adjacent surface of the panel, said support means including flexible means having a proximal portion attached to the housing and a distal terminal portion disposed in spaced alignment with a portion of the housing for limited relative movement of said distal terminal portion with respect to the housing; and

yieldable latching means extended from said housing for engaging an opposing surface of the panel in response to said resilient pressure engagement of the support means with said adjacent surface of the panel.

4,588,855

SEMICONDUCTING COMPOSITIONS AND WIRES AND CABLES USING THE SAME

Yoshikazu Kutsuwa; Kouji Kitahara, and Toshiyuki Ishii, all of Ichihara, Japan, assignors to DuPont-Mitsui Polychemicals Co., Ltd., Tokyo, Japan

Division of Ser. No. 562,727, Dec. 19, 1983, Pat. No. 4,526,707.
This application Apr. 15, 1985, Ser. No. 723,293
Claims priority, application Japan, Jun. 13, 1983, 58-105588; Oct. 17, 1983, 58-193892
Int. Cl.[4] H01B *7/00, 1/06*
U.S. Cl. 174—120 SC 2 Claims

1. In a power cable composed at least of a central conductor, a crosslinked polyethylene insulating layer surrounding the conductor and an outside semiconducting layer surrounding the insulating layer, the improvement wherein the outside semiconducting layer is formed of a semiconducting composition or its crosslinked product, said composition comprising

(A) a random copolymer of propylene and an alpha-olefin having at least 4 carbon atoms as main constituents, said copolymer containing 50 to 87 mole%, based on the entire recurring units, of the propylene units, and

(B) fine particles of carbon black in an amount sufficient for the composition to have a volume inherent resistivity of 10^0 to 10^6 ohms-cm at 23° C.

2. The cable of claim 1 wherein the semiconducting composition further comprises

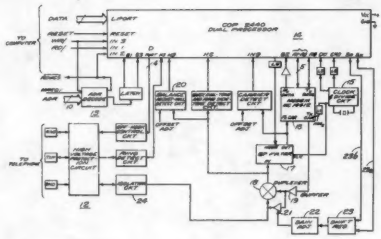
(C) at least one random copolymer selected from the group consisting of a random copolymer of ethylene and a vinyl ester having 4 or 5 carbon atoms as main constituents, said copolymer containing at least about 5.4 mole%, based on the entire recurring units, of the vinyl ester units, and a random copolymer of ethylene and an unsaturated carboxylic acid ester having 4 to 8 carbon atoms as main constituents, said copolymer containing at least 3 mole%, based on the entire recurring units, of the unsaturated carboxylic acid ester units.

4,588,856

AUTOMATIC LINE IMPEDANCE BALANCING CIRCUIT FOR COMPUTER/TELEPHONE COMMUNICATIONS INTERFACE

Sam G. Cohen, Pleasantville, N.Y., assignor to Timex Computer Corporation, Waterbury, Conn.

Filed Aug. 23, 1984, Ser. No. 643,513
Int. Cl.[4] H04M *11/00*
U.S. Cl. 179—2 C 6 Claims



1. Automatic line balancing circuit for a telephone/computer interface comprising:

a modulator/demodulator arranged to send and receive FSK modulated carrier signals including at least one transmitted carrier signal and at least one received carrier signal, to and from telephone lines of varying impedance,

a microcontroller connected to the modulator/demodulator arranged to transmit and receive digital data therefrom,

an isolation transformer coupled to said telephone lines for receiving and transmitting said carrier signals,

a duplexer connected between the isolation transformer and the modulator/demodulator, said duplexer having a first variable gain operational amplifier having a first input connected to receive said transmitted carrier signal and supply it to said isolation transformer through an output impedance connected to a junction, said duplexer having a second operational amplifier with a first input connected to said junction to amplify said received carrier signal from said transformer and a second input connected to the first input of said first operational amplifier,

a balance adjust-null detection circuit connected between said second input of the second amplifier and the output of the second amplifier and adapted to provide an output signal upon presence of transmitted carrier signal through said second amplifier,

and means for varying the gain of the first amplifier in response to output from said balance adjust-null detection circuit, said gain varying means comprising a line balancing program controlling said microcontroller to periodically sample the output from said balance adjust-null detection circuit and to periodically change the gain of said first amplifier to reduce line unbalance at the telephone/computer interface.

4,588,857

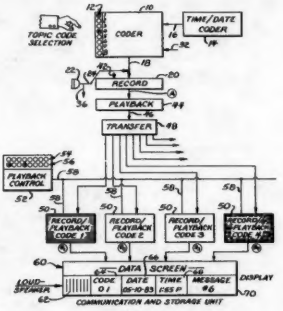
MESSAGE AGGREGATING DICTATION SYSTEM

A. Donald Arsem, 25 Northledge Dr., Snyder, N.Y. 14226

Filed Oct. 5, 1983, Ser. No. 539,175
Int. Cl.[4] H04M *1/64*
U.S. Cl. 179—6.06 15 Claims

1. Apparatus for aggregating messages comprising: first message recording means for serially recording messages, a plurality of second message recording units for recording aggregated messages, message originating means, coding means for selectively producing one of a plurality of codes, means for causing said coding means to produce a code associated with said origination of a message, message transmission means from said message originating means and said coding means to said first message recording means, playback means

connected to said first recording means, transfer means connected to said playback means and to said second recording units and operated by said code to steer each message to a selected one of said second recording units, each message



being recorded in a specific one of said recording units as steered by a respective code, and means connected to said recording units for selectively reading out messages recorded in a given recording unit as determined by a respective code.

4,588,858

DIFFERENTIAL AMPLIFIERS AND METHOD OF DIFFERENTIALLY DRIVING A TWO-WIRE LINE CIRCUIT

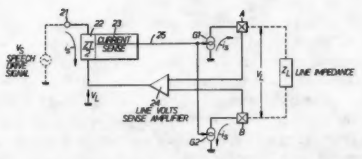
Kevin P. Watts, Sunningdale, and Jeffrey I. Robinson, Henlow, both of England, assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 12, 1982, Ser. No. 407,517

Claims priority, application United Kingdom, Aug. 19, 1981, 8125348; May 28, 1982, 8215791

Int. Cl.⁴ H04M *3/00*

U.S. Cl. 179—16 AA **11 Claims**



1. An amplifier having a differential output and an input circuit, a pair of output terminals, a reference impedance, feedback means connected to each of the output terminals and to the input circuit for monitoring the voltage on the output terminals and deriving therefrom a negative-feedback signal representing the differential voltage on the output terminals and for so applying the negative-feedback signal together with an input signal at the input circuit to the reference impedance as to cause a signal to appear across the reference impedance dependent on an additive combination of the feedback signal and the input signal on the input circuit, and output drive means including two controlled current sources coupled to the reference impedance and to the respective output terminals to apply respective currents, each being in proportion to the current flowing in the reference impedance, in respective opposite senses, to the output terminals.

4,588,859

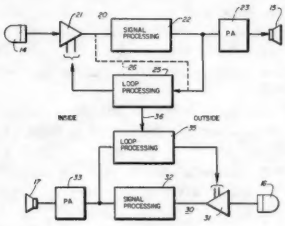
TWO CHANNEL AUDIO COMMUNICATION SYSTEM

Zvie Liberman, c/o Talk-A-Phone Co., 5013 N. Kedzie Ave., Chicago, Ill. 60625

Filed Aug. 2, 1983, Ser. No. 519,546

Int. Cl.⁴ H04M *9/08*

U.S. Cl. 179—37 **16 Claims**



1. In an intercommunication system having first and second channels for speech communication between two parties at two locations, with the microphone of the first channel and speaker of the second channel at one location for use by a first party and the speaker of the first channel and microphone of the second channel at the other location for use by the second party, each channel having an amplifier connected between the microphone and speaker, the improvement comprising:

a first gain control loop connected with the first channel to control amplifier gain of the first channel in accordance with the signal level in the first channel;

a second gain control loop connected with the second channel to contol amplifier gain of the second channel in accordance with the signal level in the second channel; and

means interconnecting the first channel with the second gain control loop to control gain of the second channel in accordance with the signal level in the first channel, the gain control loop of the first channel being independent of the signal level in the second channel whereby a signal in the first channel from the first party to the second party dominates the second channel, affording said first party control of communication from the second party to the first party.

4,588,860

BATTERY FEED CIRCUIT FOR TELEPHONE SUBSCRIBER LINE

Mitsutoshi Ayano, Tokyo; Kiyoshi Shibuya, Kawasaki; Shin-ichi Itou, Tokyo; Kenji Takatou, and Toshiro Tojo, both of Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 28, 1983, Ser. No. 566,476

Claims priority, application Japan, Dec. 30, 1982, 57-233825

Int. Cl.⁴ H04M *19/00*

U.S. Cl. 179—77 **14 Claims**

1. A battery feed circuit for supplying DC current to a two-wire subscriber line, comprising

first and second amplifiers respectively connected to first and second ones of the two wires of said subscriber line, for providing said first and second wires with respective DC voltages, said first amplifier having a power source terminal for supplying a power source voltage thereto,

first and second output resistors respectively connected between outputs of said first and second amplifiers and said first and second wires, for providing each said amplifier with a respective output impedance for the respective wire,

a DC voltage feedback loop having as an input a connection to at least said first wire, and having an output for feeding back a DC voltage proportional to the DC voltage of said first wire to said first amplifier, and

a switching power supply for comparing said power source

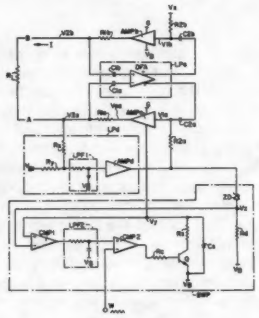
voltage supplied to said first amplifier with a voltage corresponding to the output of said DC voltage feedback loop, and for controlling said power source voltage to be lower than the voltage of said output of said DC voltage feedback loop,

wherein said switching power supply includes:

a zener diode connected between said power source terminal and said output of said DC voltage feedback loop, for providing a DC reference voltage as said voltage corresponding to the output of said DC voltage feedback loop;

a reference signal generator for generating a reference wave signal;

a first comparator means for comparing said power source voltage with said DC reference voltage, and for outputting a respective high or low voltage depending on whether said power source voltage is higher or lower than said DC reference voltage;



a second comparator means for comparing said high or low voltage with said reference wave signal, and for outputting at an output a rectangular wave having a broad or narrow width in respective corresponding to said high or low voltage output from said first comparator means; and

a switching transistor circuit means, including a transistor, a capacitor and first and second resistors, said first transistor being connected to said output of said second comparator means, said power source voltage being supplied by switching the collector current of said transistor in accordance with said rectangular wave supplied to said transistor via said first resistor, said capacitor being supplied with a discharge path through said second resistor, and said capacitor being charged by a charging path having a respective time constant and which includes said first and second amplifiers.

4,588,861

TELEPHONE INTERCOM SYSTEM

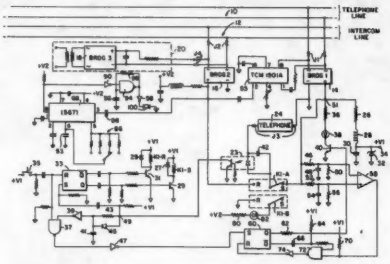
Rudor M. Teich, 137 Ralston Ave., South Orange, N.J. 07079

Filed Jul. 25, 1984, Ser. No. 634,287

Int. Cl.[4] H04M *1/72*

U.S. Cl. 179—81 R **15 Claims**

1. An intercom station module for interconnecting a conventional telephone instrument to a telephone line and an intercom line comprising a control button, means responsive to momentary operation of said control button for establishing a connection from said telephone instrument to said intercom line, means responsive to the momentary cessation of current flow through said telephone instrument for establishing a connection from said telephone instrument to said telephone line, means responsive to momentary operation of said control button when said telephone instrument is off-hook and a connection is established to said telephone line for placing said telephone line on hold, and means responsive to an abrupt



change in the DC voltage across said telephone line for removing the hold from said telephone line.

4,588,862

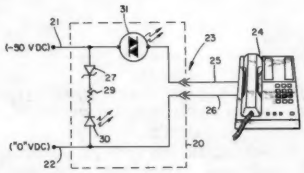
VISUAL DISPLAY NETWORK INTERFACE

James G. Grabowy, 813 Beau Dr., Des Plaines, Ill. 60016

Filed Jan. 16, 1984, Ser. No. 571,073

Int. Cl.[4] H04M *1/24*

U.S. Cl. 179—81 C **6 Claims**



1. Visual display means for placement between the incoming telephone network access line to a structure and user telephone equipment within the structure for indicating the operational status of said network access line and said telephone equipment, said visual display means comprising:

a modular housing;

a pair of outwardly visible indicators carried by said modular housing and being operable to exist in a switch-on condition when in a first mode and to exist in a switch-off condition when in a second mode; and

circuit means disposed within said modular housing and adapted to interface with existing telephone wiring within a structure and for providing a modular jack for said user telephone equipment, said circuit means being designed and arranged for controlling the switched condition of each indicator according to the operational status of the network access lines and user equipment, said circuit means includes in series a Zener diode and resistor which are in series with one of said visible indicators.

4,588,863

SYSTEM FOR FACILITATING PROFESSIONAL TELEPHONE COMMUNICATION

James M. Ress, 5300 27th St., North, Arlington, Va. 22207

Filed Jul. 11, 1984, Ser. No. 629,801

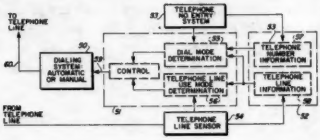
Int. Cl.[4] H04M *1/274*

U.S. Cl. 179—90 BD **1 Claim**

1. In combination with an existing telephone line, telephone appaatus comprising

(a) means for connecting said apparatus to said existing telephone lines;

(b) means for receiving the voice of a first individual utilizing said apparatus and for transmitting said voice over said telephone line;
(c) a speaker for broadcasting the voice of a second individual, said voice of second individual being carried to said telephone apparatus by said telephone line;
(d) memory means for storing a telephone number;
(e) dialing means for entering telephone numbers in said telephone apparatus, telephone numbers entered on said dialing means normally being transmitted by said apparatus through said telephone line;
(f) circuitry means for



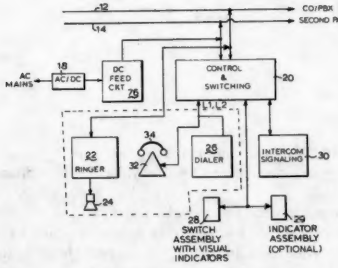
(i) causing a telephone number entered on said dialing means to be directed to and stored in said memory means when said first individual is utilizing said speaker and receiving means to communicate with said second individual over said telephone line,
(ii) detecting when said individuals have completed their conversation, and,
(iii) on detecting when said individuals have completed their conversation, automatically electronically dialing over said telephone line a telephone number stored in said memory means.

4,588,864

SMALL KEY TELEPHONE SYSTEM

Nicholas J. R. Carter, and Douglas Sutherland, both of Shelton, Conn., assignors to ITT Corporation, New York, N.Y.

Filed Sep. 21, 1984, Ser. No. 653,650
Int. Cl.⁴ H04M *1/72*
U.S. Cl. 179—99 H **22 Claims**



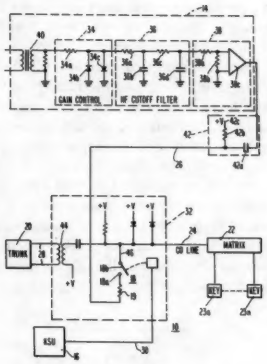
1. A telephone intercommunication system comprising:
a plurality of telephone subsets;
a first line operatively connected to said subsets for further connection to a telephone line;
a second line operatively connected to said subsets for providing a communication path between the subsets;
means, within each said subset, for transmitting audio frequency paging signals over said second line and means for receiving said paging signals;
means, within each said subset, for generating a paging control signal having a frequency range outside the audio frequency range for activating said means for receiving paging signals, said paging control signals being transmitted via said second line;
means, within each said subset, for selectively holding said first line; and
control means, associated with and self-contained in each said subset for selectively accessing said subset to one of said first and second lines and for generating and receiving control signals; said control means including a first selective push-button means, a second selective push-button means, accessing means for selectively accessing said first and second lines, and a sequencer means for controlling said accessing means, said means for generating a paging control signal, said means for receiving audio signals and said holding means.

4,588,865

MUSIC ON HOLD FOR KEY SYSTEMS

Alfred M. Hestad, Phoenix, Ariz., assignor to Vodavi Technology Corporation, Scottsdale, Ariz.

Filed Jul. 12, 1984, Ser. No. 630,059
Int. Cl.⁴ H04M *3/32*
U.S. Cl. 179—99 H **4 Claims**



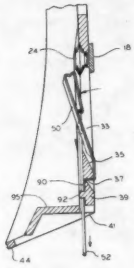
1. A music on hold system for a key telephone system having a plurality of key stations each key station having a hold command, at least one central office line coupled between a key station and a trunk line comprising:
a termination source having a resistive load,
music source means for providing a music signal,
filter means for receiving the music signal and removing the high frequency harmonics from the music signal while passing a substantial portion of the audio range,
means for providing a DC level shift to the music signal separate from the filter means,
means for applying the filtered level shifted music signal to the termination source,
a muting relay coupled to the central office line for termination of the central office line to said termination source during hold,
control means coupled to the key stations for polling the key stations and receiving a hold command from an originating key station and for generating a hold signal in response thereto,
means for decoupling the central office line from the originating key station in response to the hold signal, and
means for applying the hold signal to the muting relay means whereby the muting relay applies the filtered shifted music signal to the trunk line through the central office line in response to the hold signal.

4,588,866

MODULAR WALL PHONE LATCHING MECHANISM

James H. Monti, Corinth, Miss., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Nov. 3, 1982, Ser. No. 438,472
Int. Cl.[4] H04M *1/11*
U.S. Cl. 179—100 R **6 Claims**



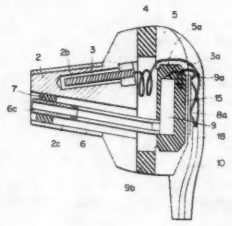
3. In combination, a base plate of a telephone set for mating with the front face of a wall receptacle and a device for mounting on said base plate to latch the base plate and telephone set carried thereon to said wall receptacle, in which the front face of said receptacle has a jack aperture therein and at least one headed rivet spaced from said aperture, said base plate including a line cord terminating in a modular plug for mating with a jack within the aperture and a keyhole opening for receiving said headed rivet, said latching device including a leaf spring member having a head section adapted to engage the headed rivet in a condition latching the telephone set to the wall receptacle, said leaf spring mounted in said base plate through a mounting opening therein, the head section of said leaf spring normally biased to extend through an opening in said base plate toward the front face of the receptacle, and in which there is means accessible from externally of the base plate and telephone set for releasing said mating on manual actuation of said release means.

4,588,867

EAR MICROPHONE

Masao Konomi, 4-4-5, Meguro Meguro-ku, Tokyo 153, Japan

Filed Sep. 29, 1982, Ser. No. 428,017
Claims priority, application Japan, Apr. 27, 1982, 57-72315; Apr. 27, 1982, 57-72316; Apr. 27, 1982, 57-72317; Apr. 27, 1982, 57-72318; Apr. 27, 1982, 57-72319; Jun. 1, 1982, 57-93860; Jun. 1, 1982, 57-93861
Int. Cl.[4] H04R *25/02, 17/00, 19/01*
U.S. Cl. 179—107 E **10 Claims**



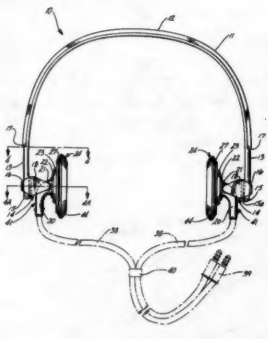
1. An ear microphone comprising:
a pickup piece of rigid material having a first portion configured for mating with a human external auditory canal;
means for converting bone-conducted voice vibrations from said auditory canal into electrical signals, said converting means being installed within the pickup piece;
resilient means attached to a second portion of said pickup piece, said resilient means having a resiliency greater than said pickup piece and a mass less than said pickup piece;
a rigid support body having a mass greater than and resiliency less than said resilient means and attached to said resilient means for supporting the pickup piece and the resilient means and adapted to extend outside the human external auditory canal while in use whereby the pickup piece, the resilient means, and the support body are arranged in a sandwich structure for reducing noise generated due to external vibrations on the ear microphone; and
said converting means having a converter lead wire means extending through the pickup piece, the resilient means and the support body for signal processing purposes.

4,588,868

HEADSET

Richard A. Bertagna, San Dimas, and Rudolfo M. Ruiz, Temple City, both of Calif., assignors to Avicom International, Inc., Pasadena, Calif.

Filed Jul. 12, 1984, Ser. No. 630,028
Int. Cl.[4] H04M *1/05;* H04R *1/10*
U.S. Cl. 179—156 R **23 Claims**



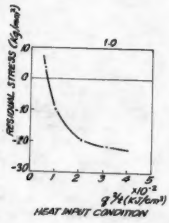
1. An acoustic headset, comprising:
a generally horseshoe-shaped flexible yoke having opposed ends;
retention means at each of the yoke ends;
a pair of support means adapted to be snap-connected to the respective yoke ends by being forced past the retention means and to be rotatably mounted on the respective yoke ends;
connecting means on each of the support means;
a pair of hollow sound-conducting bodies extending from a first end toward a second end and having connecting means adapted to effect a snap-connection with the connecting means on the support means and a rotatable mounting of the bodies on the respective support means;
attachment means at each body's second end;
a pair of ear guard means to rest along the outer rims of a listener's ears and also having attachment means adapted to effect a snap-connection with the attachment means at each body's second end; and
an acoustic connector having a pair of hollow sound-conducting tubes extending therefrom, the tube ends being connected to the respective first ends of the bodies.

4,588,869

METHOD FOR RELIEVING RESIDUAL STRESSES BY CONTROLLING WELD HEAT INPUT

Kazuo Yoshida, and Tadahiro Umemoto, both of Yokohama, Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 24, 1984, Ser. No. 583,427
Claims priority, application Japan, Feb. 28, 1983, 58-32541
Int. Cl.[4] B23K *9/04*
U.S. Cl. 219—76.14 3 Claims



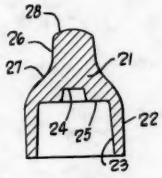
1. A method for relieving residual stresses in a butt-welded joint between pipe sections, comprising: heating the outer surface of said butt-welded joint with a welding machine such that a weld heat input condition q/t^2; where q=heat input, and t=wall thickness of the pipe section; is higher than approximately 0.01, and a relative heat transfer coefficient ht/λ; where h=heat transfer coefficient between a coolant and the inner surface of the pipe section, and λ=thermal conductivity of the pipe section; is higher than approximately 2.

4,588,870

RESISTANCE WELDING ELECTRODE CAP

Anil V. Nadkarni, Mentor, and Prasanna K. Samal, Lyndhurst, both of Ohio, assignors to SCM Corporation, New York, N.Y.

Filed Dec. 18, 1984, Ser. No. 682,874
Int. Cl.[4] B23K *11/30*
U.S. Cl. 219—119 13 Claims



1. A cold formed or machined unitary resistance welding electrode cap formed of dispersion strengthened copper and adapted to be internally cooled with a flow of coolant, said cap having a main body portion including an inner recess for coolant at its proximal end and an elongated nose portion terminating in an integral welding tip face at its distal end and an intermediate root portion connecting the nose portion and the main body portion, and wherein said nose is slightly tapered, is at least about 5 mm long from root to tip, has horizontal cross sectional area of tip not substantially in excess of about 4/10ths that of said main body portion at its greatest extent, has nose length to nose tip width ratio not substantially in excess of about 2, and is entirely of dispersion-strengthened copper except for optional jacketing of at least part of the main body portion with another metal.

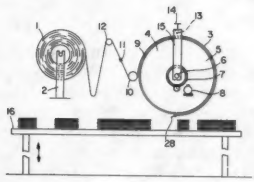
7. A process for welding steel surfaces together, at least one of which steel surfaces includes a zinc-coating, which comprises contacting opposite sides of the weld joint with resistance welding electrodes and passing an electric current therethrough of sufficient density to weld the surfaces together, the electrode or electrodes in contact with a zinc coated surface or surfaces including a cold formed or machined unitary resistance welding electrode cap formed of dispersion strengthened copper containing between about 0.25% and about 0.6% alumina by weight measured as equivalent aluminum, cooling said electrode cap internally with a flow of coolant, said electrode cap having a main body portion including an inner recess for receiving coolant at its proximal end, and a nose portion terminating in an integral welding tip face at its distal end, and an intermediate root portion disposed between the nose portion and the main body portion, and wherein said nose is slightly tapered, is at least about 5 mm long from root to tip, has horizontal cross sectional area of tip not substantially in excess of about 4/10ths that of said main body portion at its greatest extent, has nose length to nose tip width ratio not substantially in excess of about 2, and is entirely of dispersion-strengthened copper except for optional jacketing of at least part of the main body portion with another metal.

4,588,871

FABRIC CUTTING APPARATUS AND METHOD

Bernard Etcheparre, and Jean Etcheparre, both of 67, quai des Chartrons, 33000 Bordeaux, France

Filed May 12, 1982, Ser. No. 377,366
Claims priority, application France, May 20, 1981, 81 10187
Int. Cl.[4] B23K *27/00*
U.S. Cl. 219—121 LG 29 Claims



1. A method of continuously severing and stacking uniform thickness fabric pieces onto a receiving table, said method comprising:

(a) positioning and maintaining said fabric on a cutting table;

(b) severing pieces of said fabric according to a predetermined pattern by using a cutting means which is attached to a guide rail, said guide rail also being attached to said cutting table by two rotatable arms, said rotatable arms being attached to an axis of said cutting table and being positioned above said cutting table; and

(c) depositing said severed pieces onto said receiving table, said severed pieces being deposited at predetermined locations on said receiving table.

4,588,872

SELF-GUIDED WELDING MACHINE

John G. Bollinger, 6117 S. Highlands Ave., Madison, Wis. 53711; John J. Zik, 3565 Tienken Rd., Rochester, Mich. 48063, and Neil A. Duffie, 5305 S. Hill Dr., Madison, Wis. 53705

Filed Mar. 22, 1984, Ser. No. 592,512
Int. Cl.[4] B23K *9/12*
U.S. Cl. 219—124.34 21 Claims

1. Apparatus adapted for guiding a work head along an intersection wall on a work piece comprising:

(a) a work head adapted for performing an operation on a work piece;

(b) means for supporting the work head relative to the work piece for movement in two dimensions;

(c) drive means responsive to control signals for driving the work head with respect to the work piece in a direction and at a speed commanded by the control signals;

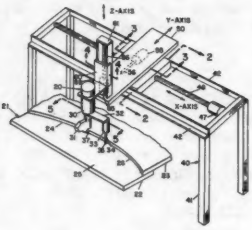
(d) means for sensing the position of the work head with respect to the work piece and providing output signals indicative thereof;

(e) a sensing probe having a tactile sensing tip which is adapted to be deflected by contact with an object, the sensing probe providing an output signal indicative of the magnitude and direction of the deflection of the tip;

(f) means for mounting the sensing probe for rotational motion about the work head and including drive means responsive to a control signal for selectively rotating the sensing probe about the work head;

(g) means for sensing the rotational position of the probe with respect to the work head and for providing an output signal indicative thereof;

(h) control means, receiving the probe deflection signals, the



probe rotational position signal and the signals indicating the position of the work head with respect to the work piece, for determining the position of the work head and of the probe and for providing and storing data indicative of the location of the intersection wall in the work piece when the sensing tip is in contact with the intersection wall and for providing control signals to the drive means driving the work head with respect to the work piece and to the drive means for rotating the probe with respect to the work head to move the work head along the location of the intersection wall as determined from data acquired as the probe contacts the intersection wall and for simultaneously moving the probe with respect to the work head to maintain the tactile sensing tip in contact with the intersection wall at a substantially constant deflection of the tip.

4,588,873

ULTRASONIC CONTROL OF WELDING

Robert Fenn, High Wycombe, and Raymond R. Stroud, Bracknell, both of England, assignors to National Research Development Corp., London, England

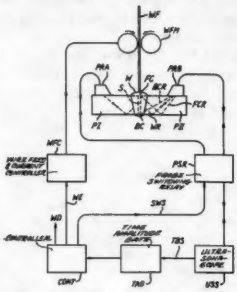
Filed Oct. 7, 1983, Ser. No. 540,772

Claims priority, application United Kingdom, Nov. 17, 1982, 8232829

Int. Cl.[4] B23K *9/10*

U.S. Cl. 219—124.34 **14 Claims**

7. An arrangement to control the position at which a weld bead is deposited on material, the arrangement including means to propagate ultrasound into a material from a surface thereof, means to pick-up ultrasound reflections and produce a signal representative of said picked-up reflections, means to gate said signal to select signal elements for reflections from extremities of the material and reflections representing the weld bead, means to assess said selected signal elements to determine the actual relative position of the bead and the extremities and produce a position signal indicative of said relative position and means responsive to said position relative



to the extremities signal to control the position at which the weld bead is deposited.

4,588,874

ELECTRICAL DEVICE FOR EVAPORATING OF ACTIVE SUBSTANCES, PREFERABLY INSECTICIDES

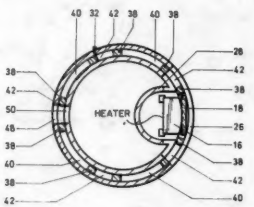
Reinhard Napierski, Talstrasse 18, 6361 Niddatal 1, Fed. Rep. of Germany

Filed Oct. 29, 1984, Ser. No. 666,176

Claims priority, application Fed. Rep. of Germany, Nov. 1, 1983, 3339832

Int. Cl.[4] A61L *9/03;* **A01M** *1/20*

U.S. Cl. 219—271 **13 Claims**



1. An electrical device for evaporating active substances, such as insecticides, contained in carrier tablets, said device comprising:

a housing having a drum;

a heater received by said housing disposed peripherally of said drum;

a protective grating spaced from and covering at least a part of said heater;

a drum magazine located on said housing for storing a plurality of the carrier tablets in a storage position located peripherally of said drum, said drum magazine being relatively rotatable with respect to said heater such that a stored carrier tablet can be transported by said relative rotation from the storage position and can be suitably introduced into the space between said heater and said protective grating.

4,588,875

MULTIPLE LOAD CONTROL APPARATUS WITH LOAD EQUALIZATION

Norman M. Kozak, Greendale, Wis., and Bernard R. Klinke, Mountlake Terrace, Wash., assignors to A. O. Smith Corporation, Milwaukee, Wis.

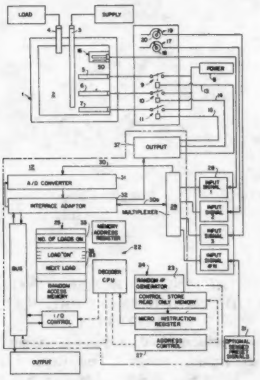
Filed Sep. 30, 1982, Ser. No. 430,513

Int. Cl.[4] H05B *1/02*

U.S. Cl. 219—485 **13 Claims**

MICROFICHE APPENDIX INCLUDED

(1 Microfiche, 32 Pages)



1. In a load system having a plurality of loads adapted to be separately activated, comprising load control means, demand signal means for identifying the number of said loads to be activated and connected to said control means to control the state of said loads, means to monitor the state of each load and identify each "on" load, and wherein each of said loads being uniquely encoded within said load control means with a number code, a random code generator adapted to generate all of said codes and operable to randomly generate any one of said codes in response to receipt of a control signal, means to compare said randomly generated code with stored load identifying codes in said load control means for determining the availability of the load means for operation, and means for operating said available load and responding to non-availability of a load to activate said code generator to generate a new code whereby said load means are operated in response to said demand signal in a statistically random manner and thereby providing for substantial equalization of the operating life of the load means.

4,588,876

ARRANGEMENT FOR THE SUPPORT OF A PROGRAM PLATE

Alfred Meisner, Nurnberg; Horst Grimmer, Nurnberg-Oberas, and Alfred-Gunther Lunz, Nurnberg, all of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Nurnberg, Fed. Rep. of Germany

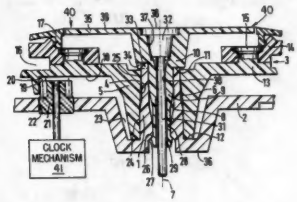
Filed May 30, 1984, Ser. No. 615,134

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1983, 3321540

Int. Cl.[4] H01H *43/10*; G04F *8/00*

U.S. Cl. 200—35 R **15 Claims**

1. In an arrangement for the support of a program plate, such as for a timer, including a bottom plate having a support sleeve fastened thereto, wherein the outer surface of said support sleeve forms a rotary bearing for a hub of said program plate, said bottom plate having an opening therethrough forming a guide for a drive pinion of a driving mechanism for the program plate, said driving mechanism being located below the bottom plate, and wherein the bottom plate is recessed in the region of the support sleeve in the direction towards the driving mechanism so as to form a cavity; the improvement comprising: said support sleeve being in the shape of a guide conduit; said hub being tubular and open-ended, said guide conduit having the outer surface thereof in contact with the inner surface of said hub to thereby form a rotary bearing; a hollow locking bolt being received in an inner surface of the guide



conduit, said locking bolt having an enlarged section at its outer end radially overhanging the guide conduit; and wherein the program plate is axially guided between a lower stop at the end of the guide conduit facing the bottom plate and the enlarged section on the locking bolt.

4,588,877

PUSH-BUTTON SWITCH

Ken Mizuta, Miyagi; Shiro Kondo, and Michitada Akazawa, both of Furukawa, all of Japan, assignors to Alps Electric Co., Ltd., Japan

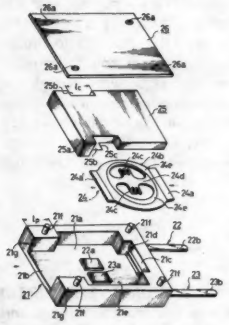
Filed Sep. 8, 1981, Ser. No. 300,442

Claims priority, application Japan, Sep. 8, 1980, 55-127361[U]

The portion of the term of this patent subsequent to Aug. 9, 2000, has been disclaimed.

Int. Cl.[4] H01H *5/20, 13/38*

U.S. Cl. 200—67 DB **6 Claims**



1. A push-button switch comprising an inversive spring movable contact piece including an inversive portion and arms formed in a manner to hold said inversive portion therebetween, said inversive portion and said arms being integrally formed of a highly-resilient electrically-conductive metal sheet, said inversive portion being substantially centrally formed with a movable contact portion having tongues; a case including an engaging portion held in engagement with one of said arms; stationary contacts fixed within said case; and a slider including a push-button portion and an engaging portion held in engagement with the other arm and installed in a manner to be movable with respect to said case; said movable contact portion being held across from said stationary contacts, said inversive portion of said inversive spring movable contact piece being inverted by depressing said push-button portion, thereby to establish electrical contact between said movable contact portion and said stationary contacts.

4,588,878

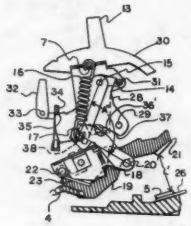
MOLDED CASE CIRCUIT BREAKER WITH REDUCED CONTACT MOUNTS

Keith W. Klein, Simsbury, and David Arnold, Old Saybrook, both of Conn., assignors to General Electric Company, New York, N.Y.

Filed Nov. 16, 1984, Ser. No. 672,214

Int. Cl.[4] H01H *3/46*

U.S. Cl. 200—153 G **3 Claims**



1. An improved operating mechanism for electric circuit interrupters of the type consisting of a spring actuated toggle mechanism and a pair of electric contacts wherein an upper link and a lower link pivotally joined by a toggle pin releasably support a movable contact arm, and an operating handle moves the movable contact arm between ON and OFF positions by connection with an operator cradle, the improvement comprising: an operator cradle consisting of a body member having three planar extensions, a first of said planar extensions having means pivotally supporting said upper link, a second of said planar extensions having means pivotally supporting said cradle body member and a third of said planar extensions having means defining:

a first stop formed on a surface of said third planar extension for capturing said toggle pin when said operating handle is moved to the OFF position to limit movement of said movable contact arm and to provide a predetermined separation distance between said pair of electric contacts, and a second stop formed on said second planar extension for capturing said toggle pin when said operating handle is moved to the ON position to provide a predetermined angle between said upper and lower links when said operating handle is in the ON position.

4,588,879

VACUUM INTERRUPTER

Yasushi Noda, and Yoshiyuki Kashiwagi, both of Tokyo, Japan, assignors to Kabushika Kaisha Meidensha, Japan

Filed Nov. 21, 1983, Ser. No. 554,122

Claims priority, application Japan, Nov. 30, 1982, 57-210512; Nov. 30, 1982, 57-210513; Apr. 26, 1983, 58-63728[U]

Int. Cl.[4] H01H *33/66*

U.S. Cl. 200—144 B **29 Claims**

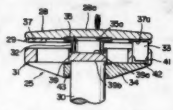
1. A vacuum interrupter comprising:

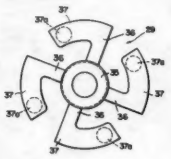
a vacuum envelope which is generally electrically insulating;

a pair of lead rods which are relatively coaxially movable extending into said vacuum envelope from the outside thereof,

a pair of contact-electrodes each mechanically and electrically connected to inner ends of said lead rods; at least one of said contact-electrodes being made of material of at most 40% IACS electrical conductivity and,

a coil-electrode made of material of electrical conductivity higher than the one contact-electrode, all portions of which are mechanically and electrically joined to a back-surface of the one contact-electrode, applying an axial





magnetic field in a direction substantially parallel to arc current flowing across an interelectrode gap.

4,588,880

NON-CONTACTING CODE RECOGNITION SYSTEM FOR CODE CARRIERS ON PRODUCTION LINE WORKPIECES

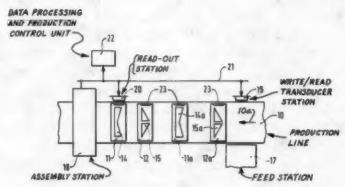
Paul Hesser, Freiberg, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 6, 1983, Ser. No. 529,613

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1982, 3234345

Int. Cl.[4] G06F *15/46*

U.S. Cl. 235—376 **20 Claims**



1. Non-contacting code recognition system, to sense information data, characterizing conditions, status, parameters, orientation, designation, and the like, of workpieces **(14, 15)** on a transport line, and providing said information data to a stationary data processing and control stage **(22)**, having

a code information carrier **(23; 24, 40)** including storage means for storing said information data form of bit patterns, associated with said workpieces;

read-out means indicating the status of the stored bit pattern;

and at least one stationary transducer station **(19, 20)** having non-contacting sensing means, located in sensing relation with respect to said read-out means and sensing the bit pattern of information data indicated thereby,

wherein, in accordance with the invention,

the information carrier **(23)** comprises an electronic memory unit **(24, 40)** and a control logic **(37)**;

one transducer station includes induction coil means **(33, 47; 191, 192, 193, 194)** for transmitting energy and data to the memory unit **(24, 40)** and command signals to said control logic;

the information carrier **(23)** further comprises

input means **(23, 33; 46–50)** located in non-contacting data transfer relation to said at least one transducer station **(19, 20)** for recording information and storing said information in the memory unit **(24, 40)**,

an electronic memory section (**25, 27; 41, 42**) to store and receive information in the form of said bit pattern;

and output means (**30; 44, 45, 50**) located in non-contacting data transfer relation to said at least one transducer station to permit scanning of data supplied to the output means by the transducer station for transmission to said control stage; and

said at least one transducer station (**19**) transmits energy by means of an alternating magnetic field having a basic frequency and transmits said command signals by superimposing a modulation, having a frequency different from said basic frequency, on said alternating magnetic field.

4,588,881

SYSTEM FOR MONITORING THE MOVEMENTS OF GOODS INWARDS AND/OR OUTWARDS

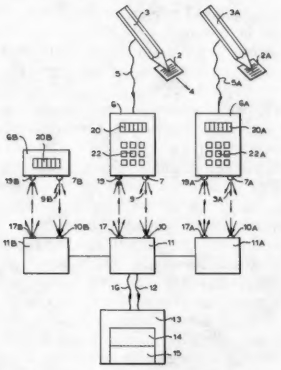
Wolfram Pejas, Reinheim; Jörg Liehmann, Griesheim, and Ulrich Brauch, Reinheim, all of Fed. Rep. of Germany, assignors to Privates Institut für Physikalisch Technische Auftragsforschung GmbH, Darmstadt, Fed. Rep. of Germany

Filed Jul. 11, 1983, Ser. No. 512,614

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1982, 3226014

Int. Cl.[4] **G06F** *15/24, 15/26*

U.S. Cl. 235—385 **3 Claims**



1. System for monitoring the movement of goods inwards and/or outwards using a reading pen for scanning a marking such as a bar code characterizing an item of goods and transmitting first electrical signals corresponding to the bar code, comprising in combination

at least one portable terminal for processing the first electrical signals and also showing data corresponding to the electrical signals in a display for checking purposes, said terminal being positioned descretely from said reading pen and connected to said reading pen by connecting wires,

a control centre with a memory,

said terminal incorporating an integrated infrared transmitter in which the first electrical signals are modulated onto a carrier wave and transmitted as infrared signals,

at least one converter with an infrared receiver adapted for converting the infrared signals into second electrical signals and including means for transmitting said second electrical signals to the control centre via connecting wires,

means for returning said second electrical signals via connecting wires to the converter and from there via an infrared beam to the display of the terminal,

means for storing said second electrical signals in areas of the memory reserved for the code of said item,

keys being provided at the terminal which when pressed give special signals via the infrared beam and the converter to said control centre, so that upon information (e.g. price of the item, storage location, stock level) relating to the last code read, being stored in the memory is transmitted as additional signals via the infrared beam and the converter to the terminal where it is displayed,

and means to send from the control centre repeated information retrieval signals to the terminal upon which it is in the receiving mode for the signals sent by the terminal concerned via the infrared beam concerned for a time of a fraction of a second in each case.

4,588,882

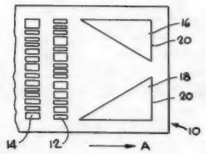
SKEW DETECTION SYSTEM FOR OPTICALLY READ DATA

James L. Buxton, East Palo Alto, Calif., assignor to Drexler Technology Corporation, Mountain View, Calif.

Filed Jun. 6, 1984, Ser. No. 617,630

Int. Cl.[4] **G06K** *19/00*

U.S. Cl. 235—487 **16 Claims**



1. A skew correction system for an elongated optical data storage medium comprising,

an elongated optical data storage medium having data tracks transverse to the length of the medium,

a pair of geometrically related marks disposed on the medium having a width dimension which varies as a function of the lengthwise dimension, the marks disposed in a known relation to the tracks and in parallel alignment therewith,

means for linearly scanning said data tracks and said marks,

means for detecting geometric deviations between the pair of marks along a linear scan of the medium and producing a deviation signal in response thereto, and

servo means for changing the alignment of said scanning means relative to the data tracks using said deviation signal.

4,588,883

MONOLITHIC DEVICES FORMED WITH AN ARRAY OF LIGHT EMITTING DIODES AND A DETECTOR

Daniel C. Abbas, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 18, 1983, Ser. No. 553,324

Int. Cl.[4] **G01J** *1/32*

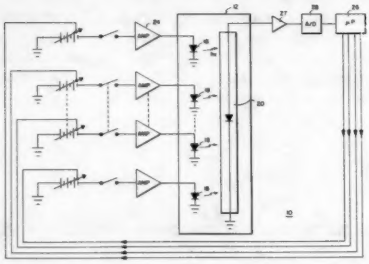
U.S. Cl. 250—205 **5 Claims**

1. A monolithic device including a semiconductor substrate, comprising:

(a) an array of light emitting diodes fabricated in the substrate, a plurality of adjustable voltage source means, and each diode of the array being responsive to a separate forward bias voltage to produce output light which is emitted from the device and subsurface light which is transmitted through the substrate; and

(b) a single detector fabricated in the substrate and located so

as to detect subsurface light from any selected light emitting diode of such array and adapted to produce a signal



representative of the intensity of output light emitted from such forward biased light emitting diode.

4,588,884

AUTOMATIC PLANT SHUTDOWN EQUIPMENT

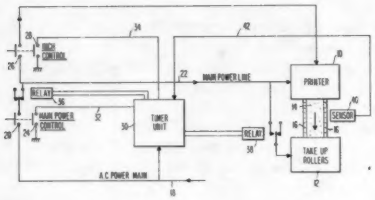
Daniel R. Priscott, Llanedeyrn, Wales, assignor to Burroughs Corp., Detroit, Mich.

Filed Mar. 27, 1984, Ser. No. 593,950

Claims priority, application United Kingdom, Sep. 13, 1983, 8324527

Int. Cl.[4] B65G *43/08*

U.S. Cl. 250—223 R **23 Claims**



1. Control equipment for industrial plant operating from a main power source and having a first control operable to connect said plant to said main power source and a second control operable at intervals during the working of said plant, said equipment comprising:

a first detector coupled to detect the operation of said first control and operable to provide an output indicative thereof;

a second detector coupled to detect the operation of said second control and operable to provide an output indicative thereof;

a timer unit, coupled to receive said outputs from said first and second detectors and comprising a first timer operable to commence a first timing operation in response to the receipt of said output from said first detector and in response to the receipt of said indication from said second detector, and operable to provide a first output indicative of said first timing operation not having endured for longer than a first predetermined period;

a first relay switch, operable to connect said plant to said main power source if and only if said timer unit is in the course of providing said first output, said first predetermined period being longer than the maximum interval between successive operations of said second control,

whereby, if said plant is being worked and said second control is being operated, said plant remains connected to said main power source but if said equipment ceases to be worked and said second control ceases to be operated, said plant is shut down by disconnection from said main power source.

4,588,885

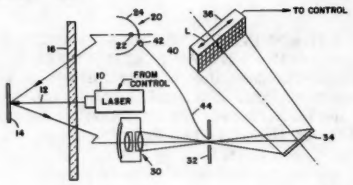
METHOD OF AND APPARATUS FOR THE REMOVAL OF PAINT AND THE LIKE FROM A SUBSTRATE

Paul A. Lovoi, Saratoga, and Alan M. Frank, Livermore, both of Calif., assignors to International Technical Associates, Santa Clara, Calif.

Filed Feb. 7, 1984, Ser. No. 577,760

Int. Cl.[4] G01N *21/27*

U.S. Cl. 250—226 **10 Claims**



1. The method of removing paint and the like from the surface of a substrate comprising the steps of:

(a) impinging light having a given spectral range on a given area of the free surface of said paint and the like;

(b) subjecting the portion of said light which is reflected from said given area of said paint and the like to spatial spectral dispersion;

(c) electronically sensing said spatial spectral dispersion and generating an electronic signal representative of said spatial spectral dispersion;

(d) electronically storing a reference electronic signal representative of a given spatial spectral dispersion of light within said given spectral range;

(e) electronically comparing said electronic signal with said reference electronic signal and, upon said comparison resulting in a substantial match between said electronic signal and said reference electronic signal, impinging a high intensity beam of radiant energy on said given area of said paint and the like for a given period of time, said beam of radiant energy having a wavelength and energy density sufficient to vaporize only a surface portion of said given area of said paint and the like in said given period of time;

(f) after said given period of time again electronically comparing said electronic signal with said reference electronic signal and again impinging said beam of radiant energy on said given area of paint and the like for said given period of time only upon said electronic comparison resulting in a substantial match between said electronic signal and said reference electronic signal, and

(g) repeating step f) until said electronic comparison results in a substantial mismatch between said electronic signal and said reference electronic signal.

4,588,886

FIBER OPTICS CONDITION SENSOR AND METHOD OF MAKING SAME

Harold F. Snider, Mansfield, Ohio, assignor to Thermo-O-Disc Incorporated, Mansfield, Ohio

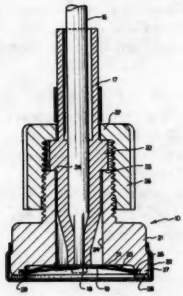
Filed Nov. 14, 1983, Ser. No. 550,817

Int. Cl.[4] H01J *5/16*

U.S. Cl. 250—227 **17 Claims**

1. A method of producing fiber optics condition sensors operable to sense changes in condition through a predetermined range of conditions comprising providing fiber optics transmitters adapted to connect a light source and a light detector in which said transmitters provide a planar termination at an end remote from said transmitter and detector, determining the range of distance through which a substantially

planar reflective surface moves toward and away from said termination to produce minimum and maximum values of reflected light transmitted through said fiber optics transmitter from said source to said detector, forming metal diaphragms with a precurvature so that a substantially planar center portion thereof moves between two predetermined positions through substantially said entire range of distance in response to said predetermined range of conditions, mounting said terminations on body assemblies, mounting the peripheries of a



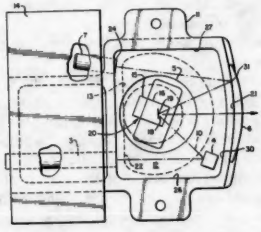
diaphragm on one of said body assemblies and positioning said termination and periphery so that said center portion in one of said predetermined positions is positioned substantially against said termination and when in the other of said predetermined positions is substantially spaced therefrom so that the value of light reflected to said detector varies from substantially said minimum value to substantially said maximum value when said diaphragm is exposed to said predetermined range of conditions.

4,588,887

RESONANT GALVANOMETER SCANNER ASSEMBLY

David C. Bailey, Cocoa Beach, and Lee M. Burberry, West Melbourne, both of Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Aug. 29, 1983, Ser. No. 527,359
Int. Cl.[4] G02B *26/10*
U.S. Cl. 250—236 **19 Claims**



1. An optical scanner housing assembly comprising:

a housing having an interior portion defined by respective wall portions thereof, and having therein a first aperture through which a beam of light is to be directed, a second aperture spaced apart from said first aperture, and a third aperture for receiving a lens; and

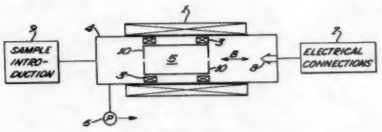
means, disposed within said interior portion of said housing, for scanning across said third aperture a beam of light directed through said first aperture, such that, for a prescribed point of the scanning of said beam, a portion of said beam is caused to be reflected off the interior face of said lens and directed through said second aperture to a photodetector coupled therewith.

4,588,888

MASS SPECTROMETER HAVING MAGNETIC TRAPPING

Sahba Ghaderi; Juda L. Shohet, and Duane P. Littlejohn, all of Madison, Wis., assignors to Nicolet Instrument Corporation, Madison, Wis.

Filed Feb. 11, 1985, Ser. No. 700,296
Int. Cl.[4] H01J *49/38*
U.S. Cl. 250—291 **11 Claims**



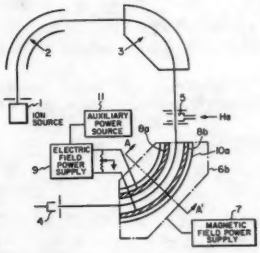
3. In a mass spectrometer of the type having vacuum chamber means, means for introducing a sample into said chamber means, means for ionizing a sample within said chamber means, means producing a generally homogeneous magnetic field within said chamber means for inducing ion cyclotron resonance, trapping means for restricting ion movement along said magnetic field, means for exciting ions restricted by said trapping means and means for detecting ion excitation, the improvement wherein said trapping means comprises means perturbing said magnetic field and establishing magnetic mirror regions within said chamber for reflecting said ions.

4,588,889

SWEEPING PROCESS FOR MASS SPECTROMETER HAVING SUPERIMPOSED FIELDS

Motohiro Naito, Tokyo, Japan, assignor to Jeol Ltd., Tokyo, Japan

Filed Feb. 4, 1985, Ser. No. 698,039
Claims priority, application Japan, Feb. 10, 1984, 59-21981; Feb. 27, 1984, 59-29415; May 22, 1984, 59-103378
Int. Cl.[4] H01J *49/32*
U.S. Cl. 250—295 **4 Claims**



1. A process for a mass spectrometer having superimposed magnetic field B and electric field E perpendicular to the magnetic field for detecting the mass m_x of fragment species arising from parent ions having mass m_0 comprising sweeping the deflection conditions in such a way that voltage Vd_x for producing the electric field and the intensity B_x of the magnetic field at all times satisfy the relation

$$Vd_x/V_{00} + (B_x/B_0)\sqrt{M_{00}/m_0} = f(m_x/m_0)$$

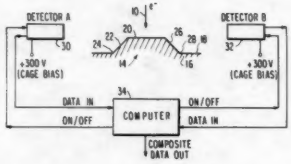
where V_{00}, B_0 and M_{00} are constants and $f(m_x/m_0)$ is a simple algebraic function of variables m_x and m_0.

4,588,890

APPARATUS AND METHOD FOR COMPOSITE IMAGE FORMATION BY SCANNING ELECTRON BEAM

Steven J. Finnes, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 31, 1984, Ser. No. 687,887
Int. Cl.[4] G01N *23/00*
U.S. Cl. 250—307 **15 Claims**



1. A method of producing an electric signal representing a precise image of the junctures of a planar surface of a specimen and the two edges of a longitudinally extending projection on the planar surface, the method comprising the steps of:

positioning first and second electron detectors on opposite transverse sides, respectively, of the projection;

transversely scanning a first electron beam along a line across the planar surface, including the projection, and detecting, with only said first detector, electrons escaping from the scanned surface, including secondary electrons, to produce a first electric signal representing the electrons detected by only said first detector;

transversely scanning a second electron beam along the line across the planar surface, including the projection, and detecting, with only said second detector, electrons escaping from the scanned surface, including secondary electrons, to produce a second electric signal representing the electrons detected by only said second detector; and

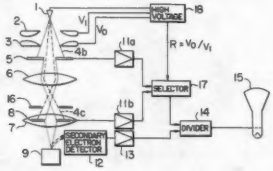
combining said first and second electric signals to produce a composite electric signal having pronounced symmetrical characteristics corresponding precisely to the locations of the two junctures.

4,588,891

SCANNING TYPE ELECTRON MICROSCOPE

Syobu Saito, Mito, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 2, 1984, Ser. No. 595,733
Claims priority, application Japan, Apr. 4, 1983, 58-57880
Int. Cl.[4] H01J *37/26*
U.S. Cl. 250—310 **14 Claims**



1. A scanning type electron microscope comprising:

(a) means for electric-field-emitting an electron beam;

(b) means for focusing the electron beam on a specimen;

(c) means for scanning the specimen with the focussed electron beam to thereby obtain an electric signal inherent in the specimen;

(d) first electron detector means disposed at a first position between the electron beam electric-field-emitting means and the specimen;

(e) second electron detector means disposed at a second position different from the first position in a direction along the axis of the electron beam between the electron beam electric-field-emitting means and the specimen;

(f) means for selecting one of the first and second electron detector means so that the selected electron detector means detects a part of the electron beam and converts the detected part into a compensation electric signal; and

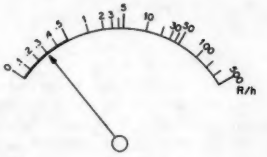
(g) means for generating a compensated electric signal corresponding to a radio of the electric signal inherent in the specimen and the compensation electric signal.

4,588,892

WIDE-RANGE RADIATION DOSE MONITOR

Manfred K. Kopp, Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 20, 1984, Ser. No. 652,395
Int. Cl.[4] H01J *47/06;* G01T *1/16, 1/175*
U.S. Cl. 250—374 **4 Claims**



1. A wide-range radiation dose-rate monitor, comprising:

a proportional counter having an anode and an ionizable gas disposed between said anode and said cathode for sensing ionizing radiation;

a current sensing means connected to said anode of said proportional counter for generating an output voltage signal proportional to an input current signal from said anode;

a meter connected to the output of said current sensing means and calibrated to indicated measured radiation dose-rate in response to said output signal of said current sensing means;

a constant amplitude oscillator for generating an a.c. output at a constant amplitude;

means for generating a selected clamping voltage signal at an output thereof;

a comparator circuit means responsive to the output voltage signal of said current sensing means and said clamping voltage signal for selectively attenuating the amplitude of said a.c. output signal of said constant amplitude oscillator at an output of said comparator circuit means in response to changes in the amplitude of the output of said current sensing means in excess of the clamping voltage;

a step-up transformer having a primary winding and a secondary winding;

a power amplifier connected between the output of said comparator circuit means and the primary winding of said transformer;

a rectifier/voltage multiplier circuit means connected between said secondary winding of said transformer and the cathode of said proportional counter for generating and applying a high voltage d.c. bias signal to said proportional counter which is proportional to the amplitude of the output signal of said comparator circuit means so that the bias voltage applied to said counter is controlled to obtain a fixed high proportional gas gain over a selected low radiation dose-rate range in which the voltage signal output of said current sensing means is less than said se-

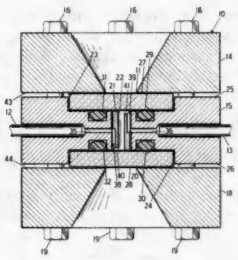
lected clamping voltage signal to provide an ionization current output from said proportional counter which varies linearly with the detected dose-rate over said selected low-radiation dose-rate range and decreasing the gas gain of said counter for radiation dose-rates above said selected low-radiation dose-rate range so that the ionization current output of said proportional counter varies nonlinearly with detected dose-rates above said selected low-radiation dose-rate range.

4,588,893

LIGHT-PIPE FLOW CELL FOR SUPERCRITICAL FLUID CHROMATOGRAPHY

D. Warren Vidrine, and Daniel R. Allhands, both of Madison, Wis., assignors to Nicolet Instrument Corporation, Madison, Wis.

Filed Feb. 25, 1985, Ser. No. 704,739
Int. Cl.[4] G01N *21/05*
U.S. Cl. 250—428 19 Claims



1. A light-pipe flow cell adapted for use in supercritical fluid chromatography comprising:

(a) a main support body having opposite sides and a bore extending therethrough from one side to the other side, and inlet and outlet channels formed in the main support body extending to openings into the bore therein;

(b) a light-pipe element inserted in the bore in the main support body and tightly engaged with the walls thereof, the metal light-pipe element having a cylindrical bore therethrough with a polished and reflective interior wall, the light-pipe element having one channel formed therein extending from communication with the inlet channel in the main support body to an inlet opening at one end of the bore of the light-pipe element and having another channel formed therein extending from communication with the outlet channel in the main support body to an outlet opening at the opposite end of the bore of the light pipe element;

(c) two light transmissive window elements positioned at the opposite sides of the main support body over the light-pipe element and each extending outwardly beyond the light-pipe element over the sides of the main support body;

(d) resilient sealing means mounted between each window element and the main support body and engaged by the window elements for sealing off the bore of the light-pipe element from the ambient atmosphere; and

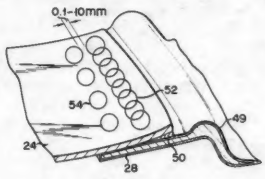
(e) means for applying force to each window element at positions over the resilient sealing means.

4,588,894

VACUUM TUBE AND A METHOD FOR MANUFACTURING THE SAME

Takezou Yasuzuka, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 13, 1984, Ser. No. 681,143
Claims priority, application Japan, Dec. 19, 1983, 58-239389
Int. Cl.[4] H01J *35/18*
U.S. Cl. 250—483.1 9 Claims



1. A vacuum tube with a window through which radiation is passed, comprising:

a first member made of radiation transparent metal, having a flat inner surface in the vicinity of the peripheral edge portion thereof, and adapted to cover the window in a vacuum-tight manner;

a second member having a flat outer surface in the vicinity of the peripheral edge portion of the window, the flat outer surface of said second member being tacked to the flat inner surface of the first member along the whole perimeter thereof by tack welding; and

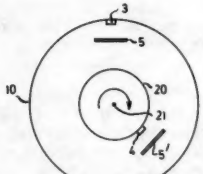
an intermediate member interposed between the respective peripheral edge portions of the first and second members, whereby the second member is finally welded to the peripheral edge portion of the first member along the whole perimeter thereof in a vacuum-tight manner by continuous spot welding, so that the position for the final welding is located outside the weld zone of the tack welding at a predetermined distance therefrom.

4,588,895

DEVICE FOR THE TRANSMISSION OF INFORMATION

Gunther Kürbitz, Königsbronn-Zang, Fed. Rep. of Germany, assignor to Carl-Zeiss-Stiftung, Heidenheim on the Brenz, Fed. Rep. of Germany

Filed Jun. 10, 1983, Ser. No. 503,312
Claims priority, application Fed. Rep. of Germany, Jun. 15, 1982, 3222441
Int. Cl.[4] G02B *27/00*
U.S. Cl. 250—551 6 Claims



1. A device for transmitting information between a rotating part and a stationary part of an apparatus, said device comprising:

(a) a rotating part;

(b) a stationary part;

(c) at least one source of light mounted on one of said parts;

(d) said source producing a modulated luminous flux containing information to be transmitted;

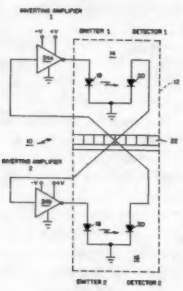
(e) at least one photosensitive receiving means mounted on the other of said parts; and
(f) diaphragm means mounted on at least one of said parts;
(g) said source and said receiving means and said diaphragm means being so formed and so positioned relative to each other that no light from said source can reach said receiving means until such light has been reflected more than once;
(h) said parts of said apparatus and at least a portion of said diaphragm means having reflecting surfaces which reflect impinging light completely but diffusely.

4,588,896

BISTABLE CIRCUITS HAVING A MONOLITHIC DEVICE FORMED WITH LIGHT EMITTING DIODES AND DETECTORS

Daniel C. Abbas, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 18, 1983, Ser. No. 553,325
Int. Cl.[4] H01J *40/14*
U.S. Cl. 250—213 A **3 Claims**



1. A bistable circuit for changing state and providing one of two optical outputs in response to an optical input, comprising:
(a) a monolithic device having first and second optically isolated stages, each stage having a light emitting diode and a corresponding detector, the light emitting diode being responsive to an applied forward bias voltage to produce: (1) subsurface light which will pass through the device and illuminate its corresponding detector which becomes active, and (2) light which exits the surface of the device to provide an optical output;
(b) signal inverting means for electrically coupling the detector of each stage to the light emitting diode of the other stage to activate such light emitting diode when its coupled detector is inactive and inactivate such light emitting diode when its coupled detector is active; and
(c) input optical means for selectively illuminating an inactive detector causing it to change to an active state, whereby the bistable device changes state.

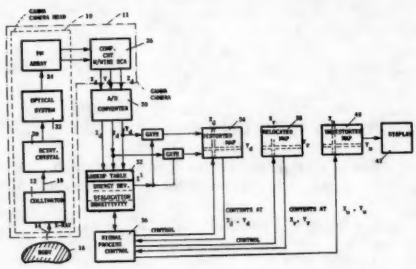
4,588,897

GAMMA CAMERA CORRECTION SYSTEM AND METHOD FOR USING THE SAME

Dan Inbar; Giora Gafni, both of Haifa; Ernest Grimberg, Kiryat Bialick, and Jacob Koren, Haifa, all of Israel, assignors to Elscint, Ltd., Haifa, Israel

Continuation of Ser. No. 161,050, Jun. 19, 1980, Pat. No. 4,424,446. This application Apr. 11, 1983, Ser. No. 483,741
Int. Cl.[4] G01T *1/209*
U.S. Cl. 250—363 S **11 Claims**

1. A gamma camera comprising:
(a) a detector head that includes a plurality of photodetectors for producing output signals in response to radiation stimuli which are emitted by a radiation field and which interact with the detector head and produce an event;
(b) signal processing circuitry responsive to the output signals of the photodetectors for producing a sum signal that is a measure of the total energy of the event;
(c) an energy discriminator having a relatively wide window for comparison with the sum signal;
(d) said signal processing circuitry including coordinate computation circuitry for operating on said output signals, and calculating an X,Y coordinate of an event when said sum signal lies within the window of said energy discriminator;
(e) an energy correction table containing spatially dependent energy windows for producing a validation signal if the



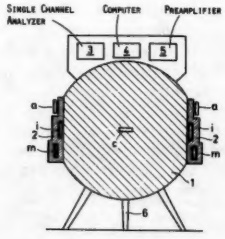
total energy of an event lies within the window associated with the X, Y coordinates of the event;
(f) said signal processing circuitry including a dislocation correction table containing spatially dependent correction factors for converting the X,Y coordinates of an event to relocated coordinates in accordance with correction factors determined by said X,Y coordinates;
(g) a digital memory for storing a map of the radiation field; and
(h) means for recording an event at its relocated coordinates in the memory if the energy correction table produces a validation signal.

4,588,898

APPARATUS FOR MEASURING DOSE ENERGY IN STRAY RADIATION FIELDS

Ernst Piesch, Eggenstein-Leop., and Bertram Burgkhardt, Karlsruhe, both of Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, Fed. Rep. of Germany

Filed May 24, 1983, Ser. No. 498,220
Claims priority, application Fed. Rep. of Germany, May 25, 1982, 3219537
Int. Cl.[4] G01T *3/00*
U.S. Cl. 250—390 **6 Claims**



1. An apparatus for measuring dose equivalent in a stray neutron radiation field, said apparatus comprising:
a moderator sphere having an outer surface;
a neutron detector disposed in the center of said moderator

sphere for producing a response representing a measurement of thermal neutrons in the center of the sphere;

at least one detector combination disposed at the outer surface of said moderator sphere and including a plurality of further neutron detectors and shielding means for providing each respective detector in said plurality of detectors with a respectively different degree of shielding for the absorption of thermal neutrons, said further detectors producing separate response representing respective measurements of albedo neutrons back-scattered by said moderator sphere and incident thermal neutrons from the radiation field;

an evaluation unit connected to receive and evaluate the responses from said detectors; and

a movable frame supporting said moderator sphere and said evaluation unit.

4,588,899

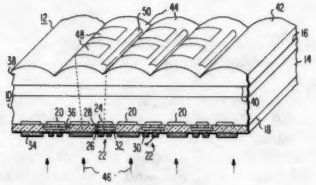
ALIGNMENT METHOD

Harry G. Erhardt, Falls Township, Bucks County, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Jun. 7, 1984, Ser. No. 618,452

Int. Cl.[4] G01N *21/00*

U.S. Cl. 250—491.1 **12 Claims**



1. In a method of achieving alignment to an article which includes a substrate having a pattern of a material at one surface thereof the steps of,

placing adjacent said article a lenticular array,

directing radiation energy through the article, and

providing relative movement between the lenticular array and the article until the entire image of the pattern appears on and is in alignment with the lenses of the lenticular array when viewed substantially normal to the surface of the lens.

4,588,900

INVERTER CONTROL SYSTEM

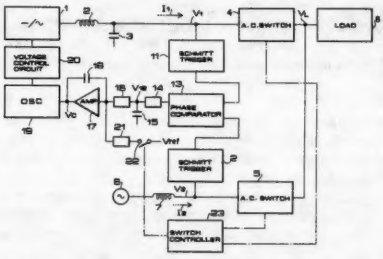
Kenji Honjo, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 20, 1984, Ser. No. 673,329

Claims priority, application Japan, Nov. 21, 1983, 58-219098

Int. Cl.[4] H02J *9/00*

U.S. Cl. 307—66 **5 Claims**



1. An inverter control system comprising:

an alternating current (a.c.) switch means which selectively operates on one of an inverter and a backup power source to supply a current to a load;

a phase locked loop (PLL) circuit including an integrating amplifier and operative to synchronize the operation of said inverter with the voltage of said backup power source;

a means supplying a certain reference voltage signal to the input of said amplifier through a second switch means;

and a switch control means which controls said a.c. switch means so as to operate on both of said inverter and backup power source to supply their outputs simultaneously to said load in a parallel operation in a transient period when supply power to said load is being switched from said backup power source to said inverter and, during said parallel operation, controls said second switch means to supply said reference voltage signal to said amplifier, said reference voltage signal causing the output of said amplifier to increase progressively the current supplied by the inverter to the load.

4,588,901

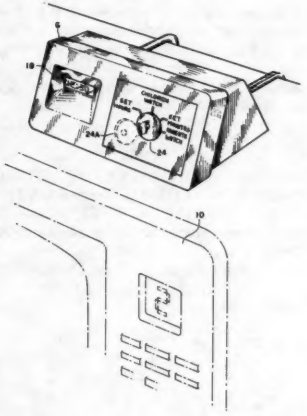
TIMER CONTROL FOR TELEVISION

William R. Maclay, Los Gatos, and William A. Hewett, San Diego, both of Calif., assignors to Pentalux Corporation, Mountain View, Calif.

Filed Feb. 14, 1985, Ser. No. 701,920

Int. Cl.[4] H01H *7/00, 3/34, 33/59, 47/00*

U.S. Cl. 307—141 **9 Claims**



1. A device for measuring and regulating the time an electrical appliance receiving power through a first power cord having a first plug thereon is used, comprising:

a first counter including means to set a time period on said first counter indicating the total time the electrical appliance can be used;

means to sense the flow of electrical current in the first power cord of the electrical appliance;

a second counter operable in response to the sensing means indicating said electrical appliance is receiving a flow of electrical current to deduct the time the appliance receives current from said time period of the first counter;

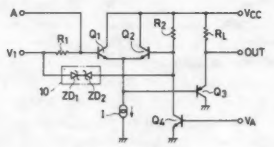
an indicator visually indicating the time period on said first counter; and

means operable to prevent said second counter from deducting time from said first counter time duration.

4,588,902
ANALOG SWITCHING CIRCUIT WITH ZENER DIODE INPUT CLAMP

Nobuharu Yazawa, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 9, 1983, Ser. No. 530,826
Claims priority, application Japan, Sep. 9, 1982, 57-158503
Int. Cl.⁴ H03G *11/02*
U.S. Cl. 307—200 A **4 Claims**

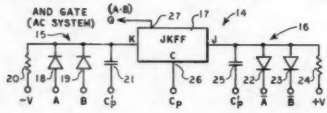


1. An analog switching circuit, comprising:
an input transistor having a base to which an input signal is applied and an emitter from which a signal corresponding to the input signal is outputted;
a bias resistor for coupling a bias voltage to said base of said input transistor;
a switching transistor having an emitter commonly connected to the emitter of said input transistor;
a constant current source connected between the common emitter of said input and said switching transistors and ground;
a control transistor for turning said switching transistor ON and OFF in accordance with a control signal; and
an input clamping circuit comprising at least a pair of Zener diodes connected in series and poled in opposition to each other, a first terminal of said input clamping circuit being connected to a base of said switching transistor, and a second terminal thereof being coupled to a base of said input transistor through said bias resistor.

4,588,903
AMORPHOUS SEMICONDUCTOR DEVICES HAVING INCREASED SWITCHING SPEED DUE TO DYNAMIC SIGNAL CONDITIONING

Robert R. Johnson, Franklin, Mich., assignor to Energy Conversion Devices, Inc., Troy, Mich.

Filed Oct. 24, 1983, Ser. No. 544,582
Int. Cl.⁴ H03K *17/04, 19/08*
U.S. Cl. 307—240 **23 Claims**

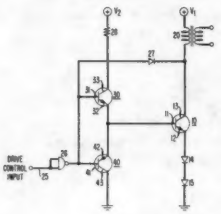


1. In an electronic system of the type including a plurality of digital circuits for providing one or more bits of discrete output in response to applied input signals, the improvement providing high speed operation of said electronic system, said improvement comprising:
at least some of said circuits including devices switchable between at least two states, said devices being formed at least in part from amorphous semiconductor alloy materials of the type which exhibit increased switching speeds, in comparison to switching speeds when in a static mode of operation, when maintained in a dynamic mode of operation characterized by preventing said devices from settling into an off condition for more than about two microseconds; and
signal source means for applying to said system dynamic signals for maintaining said switchable devices in said dynamic mode of operation.

4,588,904
HIGH EFFICIENCY BIAS CIRCUIT FOR HIGH FREQUENCY INDUCTIVELY LOADED POWER SWITCHING TRANSISTOR

Miroslav Glogolja, Somerville, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 16, 1983, Ser. No. 532,774
Int. Cl.⁴ H03K *17/04*
U.S. Cl. 307—255 **3 Claims**



1. A power switching circuit comprising:
a transistor switch including a collector, an emitter and a base;
a second transistor having a first conductivity type and connected to couple a turn-on bias voltage to the base of the transistor switch;
a third transistor having a second conductivity type opposite the first conductivity type and including a collector emitter path connected to couple the base of the transistor switch to ground potential and operative as a low impedance current path to bias the transistor switch nonconducting;
logic means for applying a common bias signal to base electrodes at the second and third transistors so that the second and third transistors are always in opposite conductivity modes;
first and second diodes connected in series coupling the emitter of the transistor switch to ground, and providing sufficient voltage drop so that a voltage drop across the first and second diodes exceeds a voltage drop across the collector emitter path of the third transistor when it is conducting; and
an anti-saturation diode coupling the base electrode of the second and third transistors to the collector of the transistor switch.

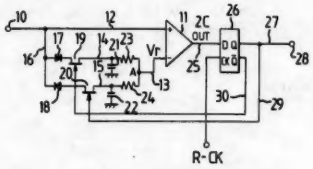
4,588,905
DIGITAL WAVEFORM CONDITIONING CIRCUIT

Tadashi Kojima, Yokosuka, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 363,627, Mar. 30, 1982, abandoned. This application Feb. 8, 1985, Ser. No. 699,233
Claims priority, application Japan, Apr. 16, 1981, 56-57560
Int. Cl.⁴ H03K *5/13, 12/00, 5/153*
U.S. Cl. 307—269 **8 Claims**

1. A digital waveform conditioning circuit which comprises:
an input terminal for receiving a signal deformed from a digital rectangular signal, said deformed digital signal having alternating positive and negative cycles;
means for generating a reference signal produced by combining positive and negative components rectified from the positive and negative cycles of the deformed digital signal;
means for comparing said deformed digital signal with said reference signal;
means for holding an output signal of said comparing means

for a period controlled by a clock signal synchronizing said output signal of said holding means with said digital rectangular signal; and



an output terminal for receiving the output signal from said holding means.

4,588,906

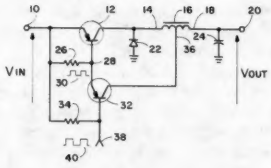
REGULATOR CIRCUIT

Gerald G. Taylor, Grass Valley, Calif., assignor to The Grass Valley Group, Inc., Grass Valley, Calif.

Filed Apr. 25, 1984, Ser. No. 603,541

Int. Cl.[4] H03K *3/16*

U.S. Cl. 307—270 **10 Claims**



1. A regulator for converting a first voltage value to a second voltage value, comprising:

an inductance for carrying a current in said regulator and having an output terminal from which said second voltage value is obtained, said inductance having a tapped connection, and

switching means having said first voltage value as an input for supplying an input current to an input terminal of said inductance, said switching means comprising first control means in a circuit with said inductance for providing current thereto and second control means in circuit with said tapped connection for supplying current thereto while also driving said first control means in response to a duty cycle drive signal.

4,588,907

INTEGRATED DIGITAL MOS SEMICONDUCTOR CIRCUIT

Willibald Meyer, and Jürgen Warwersig, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed May 14, 1984, Ser. No. 610,092

Claims priority, application Fed. Rep. of Germany, May 20, 1983, 3318564

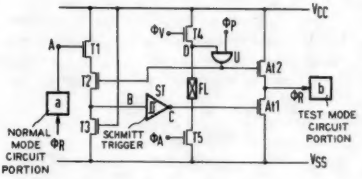
Int. Cl.[4] H03K *17/693*

U.S. Cl. 307—441 **7 Claims**

1. In an integrated digital MOS semiconductor circuit having a signal input to be connected to signals at different levels whereby a first operating mode can be initiated with signals having a first level and a second operating mode can be initiated with signals having a second level upon simultaneous shutdown of the other respective operating mode under given conditions, whereby the improvement comprises:

the signal input being connected to a gate of a first MOS field effect transistor whose drain is at a supply potential and whose source is connected via a source-drain path of a second MOS field effect transistor to an input of a Schmitt trigger and to a drain of a third MOS field effect transistor whose gate is at said supply potential and whose source is at a reference potential;

an output of the Schmitt trigger being connected to control a first input of an output amplifier which itself is connected both to the supply potential as well as to the reference potential, and a second input of the output amplifier being controlled by an AND gate having a first input connected between fourth and fifth MOS field effect transistors, the AND gate output also being connected to control the second MOS field effect transistor;



the fifth MOS field effect transistor having its source terminal connected to the reference potential and its drain terminal connected via a fusible connection to both the first input of said AND gate as well as to the source terminal of said fourth MOS field effect transistor whose drain terminal is connected to the supply potential;

a first clock signal connected to control the fifth MOS field effect transistor, a second clock signal connected to control the fourth MOS field effect transistor, and a third clock signal connected to control a second input of the AND gate; and

a signal appearing at a signal output of the output amplifier being connected to control further portions of the MOS semiconductor circuit.

4,588,908

N-ARY INPUT TO N-1 BINARY OUTPUTS LEVEL SHIFT CIRCUIT FOR I^2L

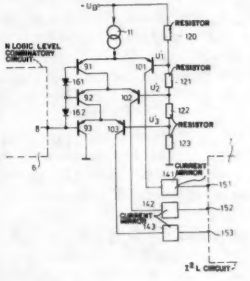
Joachim Reich, Ahrensburg, and Henning Schwarz, Reinbek, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 2, 1984, Ser. No. 585,663

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1983, 3309396

Int. Cl.[4] H03K *19/092*

U.S. Cl. 307—475 **1 Claim**



1. A circuit for level adaptation between an I^2L circuit and a preceding combinatory logic circuit, comprising a direct

current source (11) which is connected to the input of a switch which is controlled in dependence on the level of the output (8) of the combinatory logic circuit (6), characterized in that the circuit is designed for the conversion of n different logic levels on the output of the preceding circuit where n is greater than or equal to 3, the switch comprising n−1 emitter-coupled transistor pairs (91, 101; 92, 102; 93, 103), the base of one transistor (91, 92, 93) of each pair being coupled to the output (8) of the preceding circuit, the collector-emitter current path of each of said one transistor of each pair being respectively connected in series, with the emitter of the first transistor (91) of said transistors connected in series being connected to said current source (11), the collector of the other transistor (101, 102, 103) of each pair being connected to a current mirror (141, 142, 143), the base of each of said other transistor of each pair being respectively connected to a different reference voltage (U_1', U_2', U_3'), wherein the reference voltages supplied to said bases of said other transistors of each pair are ordered such that the other transistor (101) of said pair having said one transistor (91) connected to the current source (11), receives the highest reference voltage (U_1').

4,588,909

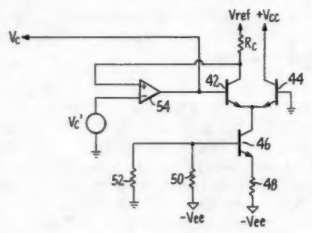
DISTORTION COMPENSATING CIRCUIT

Ronald Quan, Cupertino, Calif., assignor to Sony Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 443,250, Nov. 22, 1982, Pat. No. 4,516,041. This application Nov. 8, 1983, Ser. No. 549,992

Int. Cl.⁴ G06G *7/10, 7/12*

U.S. Cl. 307—491 **6 Claims**



1. In combination, a precompensation circuit and a voltage controlled capacitor circuit, the voltage controlled capacitor circuit having a capacitance which has a non-linear relationship with respect to a signal applied to a nonlinear control input of the voltage controlled capacitor circuit, said precompensation circuit being coupled between the nonlinear control input and an uncompensated control signal source and comprising:

uncompensated circuit means for providing a compensated control signal for the nonlinear control input of the voltage controlled capacitor circuit in response to a feedback signal and in response to a control signal from the uncompensated control signal source; and

reproducing means for producing said feedback signal in response to said compensated control signal, said feedback signal and said compensated control signal having a nonlinear relationship with respect to each other which substantially corresponds to the inverse of the nonlinear relationship between the capacitance of the voltage controlled capacitance circuit and a signal applied to the nonlinear control input.

4,588,910

REVERSING SWITCH ARRANGEMENT FOR AN ELECTRIC TOOL

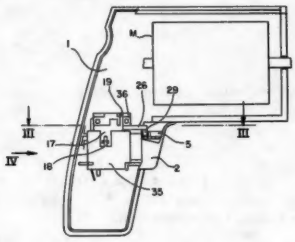
Alfred Bausch, Waldbrunn-Hintermeilingen, Fed. Rep. of Germany, assignor to Black & Decker Inc., Newark, Del.

Filed Oct. 30, 1984, Ser. No. 666,433

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1983, 3342412

Int. Cl.⁴ H01H *9/26*; H02K *7/14*

U.S. Cl. 310—50 **23 Claims**



19. A portable electric tool, comprising:

a housing having a motor compartment and a handle extending downwardly thereform;

a trigger switch in said housing and having a depressable actuating trigger, said trigger extending forwardly from said handle in a longitudinal direction;

a reversing switch in said housing;

an adaptor mounted in said housing, said trigger switch and said reversing switch being mounted in said adaptor with said reversing switch above said trigger switch;

a bell crank lever having two legs extending transversely to each other, said lever being pivotally connected to said reversing switch and being pivotal between two positions for actuating said reversing switch;

said trigger having two slots therein, said slots being disposed side by side and extending parallel to said direction;

one of said legs extending forwardly in said direction and having a downward projection engageable in a respective one of said slots, depending upon the pivotal position of said lever, when said trigger is depressed;

said trigger having a partition between said slots and which coacts with said projection to prevent pivoting of said lever when said trigger is depressed; and

the other of said legs extending transversely to said trigger and engaging in a cavity in a manually operable slide mounted slidably in an orifice in a side wall of said handle.

4,588,911

ALTERNATING CURRENT GENERATOR ROTOR AND FAN

Lowell C. Gold, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

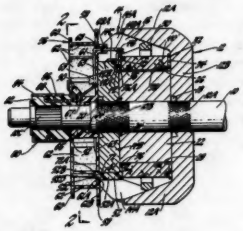
Filed Dec. 14, 1984, Ser. No. 681,638

Int. Cl.⁴ H02K *9/00*

U.S. Cl. 310—62 **5 Claims**

1. A combined rotor and fan for an alternating current generator comprising, a shaft, a pair of pole segments carried by said shaft formed of magnetic material having a plurality of interleaved pole teeth, means defining a core member, a field coil supporting spool formed of electrical insulating material disposed about said core member and located between said pole segments, a field coil supported by said spool, a plurality

of posts integral with said spool extending axially thereof and extending through spaces located between the pole teeth of



one of said pole segments, and said fan secured to the ends of said posts.

4,588,912

D.C. BRUSHLESS MOTOR WITH AN IMPROVED YOKE

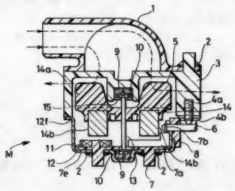
Tetsuro Shinmura, and Tutomu Kinoshita, both of Kariya, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Oct. 9, 1984, Ser. No. 658,651

Claims priority, application Japan, Oct. 24, 1983, 58-199832; Aug. 24, 1984, 59-177295

Int. Cl.⁴ H02K *11/00*

U.S. Cl. 310—68 R **8 Claims**



1. A D.C. brushless motor, comprising:

(a) a rotor having a plurality of magnets; and

(b) a stator having a generally cup-shaped metallic yoke, a drive coil, a drive circuit, a magnetoelectric transducer, terminals, and an insulating base plate attached to said yoke, said base plate having a recess and wall surrounding said recess for defining a circuit housing at a first side, both said base plate and said walls being made of a synthetic resin being integral with each other, said drive circuit being formed on a substrate on which said magnetoelectric transducer is also placed, said substrate carrying said drive circuit and said magnetoelectric transducer on a front surface thereof being received in said recess of said base plate side of said substrate is flush with a second side of said, said circuit housing being filled with a synthetic resing so as to hermetically seal said drive circuit and said magnetoelectric transducer, said drive coil being placed on said first side of said base plate at a place other than said circuit housing, at least one of said walls radially protruding from the periphery of said base plate, said terminals being embedded in said at least one wall and being connected to said drive circuit at one ends thereof and the other ends thereof being protruding from said first side of said base plate, said terminals extending in a direction normal to a plane of said base plate toward said rotor, said base plate being positioned on a substantially flat bottom of a center recess of said yoke such that said first side faces said magnets of said rotor with a second side of said base plate being substantially in close contact with said bottom of said center recess of said yoke, said substantially flat bottom of said center recess of said yoke substantially facing an entire one side surface of said rotor.

4,588,913

STEPPING MOTOR LINEAR ACTUATOR WITH INTERNAL CLUTCH

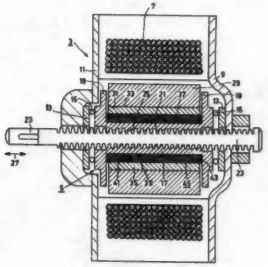
Hans J. Adami, Hamburg, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 3, 1983, Ser. No. 500,676

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1982, 3221792

Int. Cl.⁴ H02K *7/10*; F16D *7/02*

U.S. Cl. 310—78 **9 Claims**



1. A linear actuator comprising

a stepping motor stator,

a rotor sleeve having a helical thread, mounted to be rotatable with respect to said stator,

a threaded spindle engaging said helical thread and mounted to be axially movable with respect to said stator, and

a rotor-magnet sleeve surrounding said rotor sleeve for imparting rotation to said rotor sleeve,

characterized by comprising a slip coupling arranged between said rotor sleeve and said rotor-magnet sleeve and supporting said rotor-magnet sleeve with respect to said rotor sleeve, said slip coupling having a torque less than the maximum stepping motor torque,

whereby engagement of said spindle with a stop does not cause the rotor-magnet sleeve to get out of step.

4,588,914

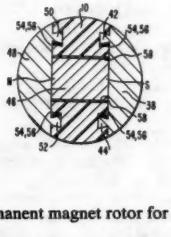
PERMANENT MAGNET ROTOR FOR HIGH SPEED MOTORS AND GENERATORS

Carl J. Heyne, Hampton Township, Allegheny County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 5, 1984, Ser. No. 617,455

Int. Cl.⁴ H02K *21/14*

U.S. Cl. 310—156 **5 Claims**



1. A two-pole permanent magnet rotor for a dynamoelectric machine comprising:

a nonmagnetic structure having a central axis, a central cavity, two diametrically opposed arcuate peripheral

surfaces, and two diametrically opposed dovetail mating elements extending parallel to said axis;

a pair of magnetic pole pieces, each having an arcuate peripheral surface and an internal surface including a longitudinal dovetail mating element forming a dovetail joint with one of said dovetail mating elements of said nonmagnetic structure;

a permanent magnet positioned within said central cavity such that each pole of said permanent magnet lies adjacent to the internal surface of one of said magnetic pole pieces; and

a plurality of tapered drive wedges, positioned between one side of each of said dovetail mating elements of said magnetic pole pieces and an adjacent side of a dovetail mating element of said nonmagnetic structure, such that a radially inward compressive force is exerted on said permanent magnet by the internal surface of each of said pole pieces.

4,588,915

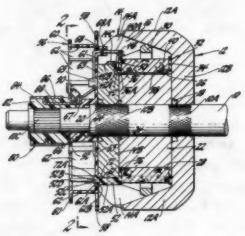
ALTERNATING CURRENT GENERATOR ROTOR

Lowell C. Gold, and Mark H. Hanshew, both of Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 14, 1984, Ser. No. 681,645

Int. Cl.[4] H02K *19/26*

U.S. Cl. 310—194 **6 Claims**



1. A flux generating unit for electrical apparatus comprising, a core member formed of magnetic material having a plurality of axially extending circumferentially spaced slots, a coil supporting spool formed of electrical insulating material disposed about said core member having a plurality of axially extending circumferentially spaced ribs joined to and extending between a pair of radially extending end flanges, said ribs being located in said slots, and a coil winding supported by said spool and core member, said coil winding comprising a plurality of turns of wire disposed about the longitudinal axis of said core member with the inner turns thereof engaging the outer surfaces of said ribs and outer surfaces of said core member disposed between said ribs, said end flanges engaging opposite end portions of said coil winding to thereby retain said coil winding between said flanges.

4,588,916

END TURN INSULATION FOR A DYNAMOELECTRIC MACHINE

Robert J. Lis, Willowbrook, Ill., assignor to General Motors Corporation, Detroit, Mich.

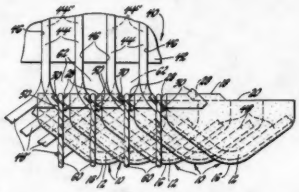
Filed Jan. 28, 1985, Ser. No. 695,272

Int. Cl.[4] H02K *3/46*

U.S. Cl. 310—260 **4 Claims**

1. For a dynamoelectric machine having a slotted stator, a plurality of insulated stator windings supported by the stator slots such that winding end turns extending exteriorly of the stator from adjacent stator slots overlap before returning to different stator slots, such overlapping end turns being tied together with a cord at the point of overlap to prevent relative movement therebetween during operation of the machine, and winding separators inserted between overlapping end turns prior to the tying thereof for increasing the insulation therebetween, the improvement wherein:

the winding separator is formed of flat insulative material comprising a main body defined by a generally straight stator facing edge and a curved edge generally resembling the contour of a stator winding end turn, and a tab extending in the plane of said main body from the stator facing edge thereof, said tab being formed in part by a portion of said main body such that folding said tab back onto said main body along the stator facing edge thereof prior to insertion of the winding separator between the winding



end turns operates to define a notch in said stator facing edge which is overlapped by a complementary portion of said tab, so that when the cord is tied around the winding end turns, it seats in the notch of the inserted winding separator and thereby bends the complementary tab portion into engagement with one of the overlapping winding end turns so that the complementary tab portion is positioned between the cord and the end turn, thereby providing increased insulation between the overlapping end turns and preventing the winding insulation from becoming damaged by contact with the cord.

4,588,917

DRIVE CIRCUIT FOR AN ULTRASONIC GENERATOR SYSTEM

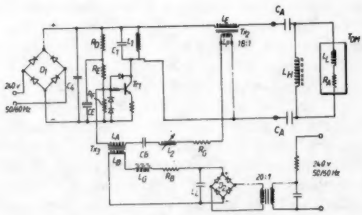
Henry K. Ratcliff, 14 Hadfield Avenue, Hoylake, Wirral, Merseyside, L47 3DJ, England

Filed Dec. 17, 1984, Ser. No. 682,236

Claims priority, application United Kingdom, Dec. 17, 1983, 8333696

Int. Cl.[4] H01L *41/08*

U.S. Cl. 310—316 **6 Claims**



1. An ultrasonic generator system, comprising:

(a) a D.C. supply;

(b) an inductance;

(c) a switching transistor having an input;

(d) said inductance and said switching transistor being connected in series across said D.C. supply;

(e) a capacitor connected (for A.C. purposes) in parallel with said inductance;

(f) reactive means for providing a reactance;

(g) an ultrasonic transducer;

(h) said reactive means and said transducer being connected in series to form load means for providing a load and an electrical resonant circuit formed by said reactive means and the electrical reactance of the said transducer;

(i) said load means being connected in parallel across said inductance; and

(j) a power amplifier including said switching transistor, said inductance, said capacitor and said reactive and for driving said ultrasonic transducer with a sinusoidal load current which does not flow in said inductance, and which is controlled by an A.C. signal voltage applied to the input of the said switching transistor.

4,588,918

HOUSING AND MOUNT FOR CHIP TYPE PIEZOELECTRIC RESONATOR

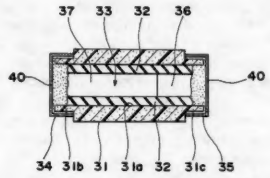
Takashi Yamamoto, Hakui; Hiroyuki Takahashi, and Satoshi Awata, both of Takaoka, all of Japan, assignors to Murato Mfg. Co., Ltd., Nagaokakyo, Japan

Filed Apr. 30, 1985, Ser. No. 729,342

Claims priority, application Japan, May 8, 1984, 59-67491[U]

Int. Cl.[4] H01L *41/08*

U.S. Cl. 310—348 **3 Claims**



1. A chip type piezoelectric resonator which comprises an element having a rectangular piezoelectric substrate and electrode layers respectively formed on opposite main surfaces of the piezoelectric substrate so that a central portion of said piezoelectric substrate located between said electrode layers effects an energy trapped type thickness shear vibration, and a chip-like case axially formed therein with a through-bore, said element being held in a rubber-like elastic member filled in said through-bore so as to be capable of performing the energy trapped type thickness shear vibration, said electrode layers of said element being each electrically conductively connected to metallic caps respectively attached to end faces of the opening at opposite ends of the through-bore of said case.

4,588,919

LOW-PRESSURE ALKALI METAL VAPOR DISCHARGE LAMP WITH ARC TUBE GETTERING

Wiggert Kroontje, and Franciscus M. P. Oostvogels, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

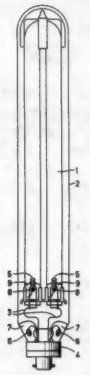
Filed Apr. 9, 1984, Ser. No. 597,977

Claims priority, application Netherlands, Apr. 25, 1983, 8301447

Int. Cl.[4] H01J *61/22, 61/26, 61/34*

U.S. Cl. 313—25 **2 Claims**

1. A low-pressure alkali metal vapor discharge lamp, comprising an evacuated outer bulb; a discharge envelope arranged in said bulb; electrodes arranged in the discharge envelope for establishing an arc discharge path during operation of the lamp, said electrodes including an emitter comprising an alkaline earth metal oxide; current-supply conductors extending through a wall of said outer bulb and a wall of said discharge envelope to said electrodes; and a filling, contained in said envelope, comprising an inert gas and an ionizable alkali metal, in an operating condition of the lamp the arc discharge being carried primarily by alkali metal vapor,



characterized by comprising a getter holder and a getter for bi- and triatomic gases arranged in said envelope to achieve reduction in lamp starting voltage.

4,588,920

DISPLAY TUBE AND AN ELECTRON BEAM DEFLECTOR THEREFOR

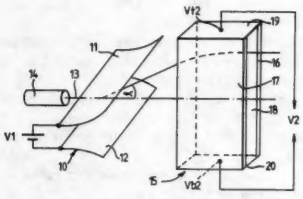
James Smith, Reigate, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 21, 1982, Ser. No. 451,996

Claims priority, application United Kingdom, Feb. 5, 1982, 8203341

Int. Cl.[4] H01J *29/74*

U.S. Cl. 313—422 **10 Claims**



1. A display tube including an envelope containing an electron gun for producing an electron beam and horizontal and vertical deflection means for deflecting the beam in horizontal and vertical planes extending along a path followed by the beam, at least one of said deflection means comprising, in succession along said path;

(a) a first electrode arrangement including a first pair of plates disposed on opposite sides of the path and including means for electrical connection to a first source of a potential difference, said plates being oriented to produce an electric field in a direction transverse to said path to effect deflection of the beam in the respective plane by an angle α; and

(b) a second electrode arrangement including a second pair of plates, comprising resistive electrodes, disposed on opposite sides of the path and including means for electrical connection of opposite ends of each of said resistive electrodes to a second source of a potential difference having a polarity opposite to that of the first source, said second pair of plates being oriented to produce an electric field in a direction opposite to that produced by the first pair of plates and having a predetermined strength and

extending along a predetermined length of said path to counterdeflect the electron beam in the respective plane by an angle $-\alpha$ onto a path parallel to that along which it entered the first electrode arrangement.

4,588,921

VACUUM-FLUORESCENT DISPLAY MATRIX AND METHOD OF OPERATING SAME

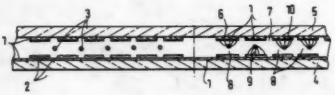
Kurt M. Tischer, Wendlingen, Fed. Rep. of Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Continuation of Ser. No. 340,929, Jan. 20, 1982, abandoned. This application Nov. 16, 1984, Ser. No. 672,154

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1981, 3103293

Int. Cl.[4] H01J *1/62, 63/04*

U.S. Cl. 313—496 10 Claims



1. A flat-type vacuum-fluorescent display matrix comprising:

a vacuum housing having two spaced apart parallel plates forming opposing portions of the housing wall thereof, at least one of said two plates being transparent;

a first plurality of parallel, spaced, first strip conductors disposed within said housing on an inner surface of a first one of said two plates;

a second plurality of parallel, spaced, second strip conductors disposed within said housing on an inner surface of a second one of said two plate, said second conductors being disposed in an orthogonal relationship with respect to said first conductors, the respective intersections of said first plurality with said second plurality defining a matrix of picture point locations;

fluorescent material coated on said first strip conductors in the vicinity of each of said picture point locations;

a cathode arrangement disposed in said housing above said first plurality of said first conductors and below said second plurality of said second conductors;

means for connecting said cathode arrangement to a first potential;

means for connecting a selected one and non-selected ones of said first plurality of first strip conductors respectively to a second potential and to a third potential; and

means for connecting a respective selected one and other non-selected ones of said second plurality of second strip conductors respectively to a fourth potential and a fifth potential;

wherein said second and fifth potentials are positive relative to said first potential and said third and fourth potentials are negative relative to said first potential;

whereby said fluorescent material will be excited in the vicinity of the picture point location defined by the intersection of said selected first strip conductor and said selected second strip conductor by electrons emitted from said cathode which are repulsed by said relatively negative fourth potential applied to said selected second strip conductor and attracted by said relatively positive second potential applied to said selected first strip conductor; and

whereby those electrons emitted from said cathode in the vicinity of the respective said picture point locations associated respectively with said non-selected first strip conductors and with said non-selected second strip conductors will be respectively repulsed by said relatively negative third potential away from said fluorescent material and will be sucked away from said fluorescent material by said relatively positive fifth potenital.

4,588,922

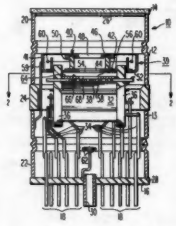
ELECTRON DISCHARGE DEVICE HAVING A THERMIONIC ELECTRON CONTROL PLATE

Richard D. Faulkner, Manheim Township, Lancaster County, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Mar. 19, 1984, Ser. No. 590,792

Int. Cl.[4] H01J *40/04, 43/06*

U.S. Cl. 313—533 5 Claims



1. In an electron discharge device of the type including an evacuated envelope having therein a plurality of elements including a photoemissive cathode for providing photoelectrons in response to radiation incident thereon, electron multiplier means having a primary dynode spaced from said cathode, focus means disposed between said cathode and said multiplier means for focusing said photoelectrons, and means for applying operating potentials to said elements, the improvement comprising

a thermionic electron control plate disposed between said focus means and said multiplier means for preventing thermionic electrons emanating from said focus means from impinging on said primary dynode while permitting the passage of said photoelectrons to said primary dynode, said control plate overlying said primary dynode and being contiguous therewith, said control plate and said primary dynode being electrically connected.

4,588,923

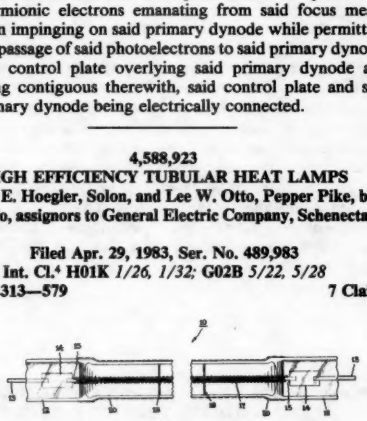
HIGH EFFICIENCY TUBULAR HEAT LAMPS

Leonard E. Hoegler, Solon, and Lee W. Otto, Pepper Pike, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 29, 1983, Ser. No. 489,983

Int. Cl.[4] H01K *1/26, 1/32;* G02B *5/22, 5/28*

U.S. Cl. 313—579 7 Claims



1. A lamp for transmitting a desired portion of the radiation specturm for impinging onto a selected medium and inhibiting transmission of an unwanted portion of the radiation spectrum, said lamp comprising:

a single radiation transmissive envelope containing a filling of inert gas and a relatively small quantity of a halogen gas;

a tungsten filament for emitting radiation wavelengths in both the visible and infrared portions of the radiation spectrum, said filament being housing within and in close proximity to the walls of said envelope;

a reflective film on the outer surface of said envelope and effective to withstand an operating temperature of about 950° C., and to filter the radiation to be transmitted through said envelope;

said film comprising a plurality of stacks of layers of high and low indices refractory material and effective to establish a pass-band characteristic, and a stop-band characteristic both for the portion of radiation to be transmitted through said envelope, said pass-band and said stop-band characteristics being predeterminedly selected for said medium desired to be impinged by the radiation to be transmitted; through said envelope; and

each of said stacks of layers consisting of a first, a second and then a third stack, said first, second and third stacks each consisting of layers of high index refractory material of predetermined thicknesses within ranges in nanometers of 83 to 137, 265 to 372, and 207 to 366 respectively and said stacks further having layers of low index refractory material of predetermined thicknesses within the ranges in nanometers of 142 to 207, 142 to 219, and 190 to 245, respectively.

4,588,924

HIGH EFFICIENCY CONVERTER FOR DISCHARGE LAMPS

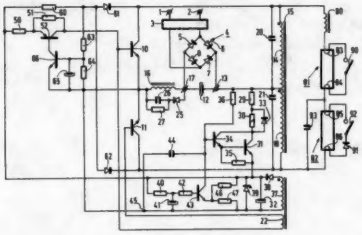
Meerten Luursema, and Hilbert Palmers, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 5, 1984, Ser. No. 628,374

Claims priority, application Netherlands, Jul. 13, 1983, 8302498

Int. Cl.⁴ H05B *41/36*

U.S. Cl. 315—107 **12 Claims**



1. An arrangement comprising a DC/AC converter for igniting and feeding a discharge lamp having preheatable electrodes, the converter including a starting circuit and in which, in the connected condition of the lamp, the ends of the lamp electrodes remote from the converter are connected to each other by means of a circuit comprising a relay make contact, wherein the starting circuit of the DC/AC converter comprises an energizing winding of the relay contact, the converter having a timing circuit which controls a switching element in the starting circuit, the time constant of the timing circuit being such that 0.2 to 5 seconds after the converter has been switched on, the switching element interrupts the starting circuit.

4,588,925

STARTING CIRCUIT FOR LOW-PRESSURE DISCHARGE LAMP, SUCH AS A COMPACT FLUORESCENT LAMP

Hans-Jürgen Fähnrich, and Ulrich Roll, both of Munich, Fed. Rep. of Germany, assignors to Patent Treuhand Gesellschaft fur elektrische Gluhlampen GmbH, Munich, Fed. Rep. of Germany

Filed Mar. 19, 1984, Ser. No. 591,211

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1983, 3311215

Int. Cl.⁴ H05B *39/00*

U.S. Cl. 315—101 **16 Claims**

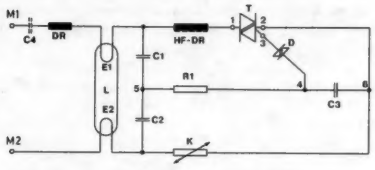
1. A ballast and starting circuit for a low-pressure discharge lamp (L) having heater electrodes (E1, E2) and a choke (DR) connected in series with said electrodes, said circuit including

two main terminals (M1, M2);

a triac (T) having main current terminals (1, 2) connected in a circuit path parallel to the discharge path of the lamp and in series with the heater electrodes thereof;

wholly capacitive voltage divider, comprising two serially connected capacitor unit (C1, C2) of at least approximately equal value, connected in parallel to said lamp and having a voltage divider junction (5) located between said capacitor units;

a diac (D) having one terminal connected to the gate or control electrode (3) of the triac;



a control circuit for the diac including a charge resistor (R1) connected to the voltage divider junction (5) and to the other terminal (4) of the diac, and a trigger capacitor (C3) connected to the other terminal (4) of the diac and to one (2) of the current terminals (1, 2) of the triac,

wherein, in accordance with the invention,

said triac (T) and said capacitive voltage divider are connected in parallel to each other, such that said ballast and starting circuit operates substantially as a choke ballast when the circuit path containing said triac is substantially conductive and said circuit operates substantially as a choke-and-capacitor ballast when said triac (T) is nonconductive.

4,588,926

ANTI-FLICKER CIRCUIT FOR AUTOMATIC TURN-ON OF NIGHTLIGHT

Donald E. Pezzolo, Cupertino, Calif., assignor to Intermatic Incorporated, Spring Grove, Ill.

Filed Aug. 12, 1983, Ser. No. 522,911

Int. Cl.⁴ H05B *37/02*

U.S. Cl. 315—155 **6 Claims**

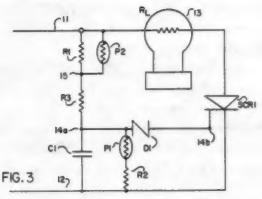


FIG. 3

1. In an automatic light turn-on circuit including a lighting load having a fixed impedance, an electronic switch including a gate electrode for receiving a gating current for turning on said switch, a voltage divider comprising a first resistor in series with a first photosensitive element connected in parallel to a capacitor, a diode connected in series between said element and said gate electrode of said electronic switch wherein during daylight hours the element has a relatively low impedance resulting in insufficient voltage developing across the capacitor to turn on said diode and trigger said electronic switch to turn on said lighting load, said element at dusk having sufficient impedance to insure sufficient voltage across said capacitor to turn on said diode, said electronic switch and said lighting load, the improvement comprising means for prevent-

ing flicker of said lighting load at dusk and dawn by light from said lighting load striking said element, said means comprising:

a second photosensitive element disposed to strongly sense radiant energy from said lighting load and electrically connected in parallel with at least a portion of said first resistor and effective, when light from said lighting load strikes said second photosensitive element, to shunt out said portion of said first resistor thereby to raise the voltage across said capacitor.

4,588,927

LIGHT SUPPLY APPARATUS FOR AN ENDOSCOPE

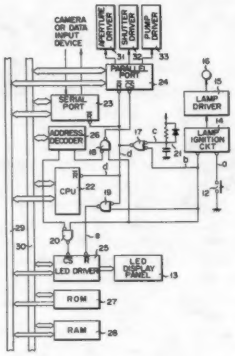
Masahide Kanno; Atsushi Amano; Seiichi Hosoda, and Shinichiro Hattori, all of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jul. 27, 1984, Ser. No. 635,243

Claims priority, application Japan, Aug. 5, 1983, 58-143549

Int. Cl.[4] H01K *7/00*

U.S. Cl. 315—307 **6 Claims**



1. A light supply apparatus for an endoscope, comprising:

light source means for supplying light to an endoscope;

light source igniting means for igniting said light source means;

ignition detecting means for detecting the ignition of said light source means;

display means for displaying various data;

a microprocessor for controlling said display means and various driver means;

reset means for resetting the microprocessor when said ignition detecting means detects the ignition of the light source means; and

means responsive to the detection of ignition for maintaining at least said display means in the same state as before the ignition of the light source means.

4,588,928

ELECTRON EMISSION SYSTEM

Ruichen Liu, and Michael G. R. Thomson, both of Berkeley Heights, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 15, 1983, Ser. No. 504,671

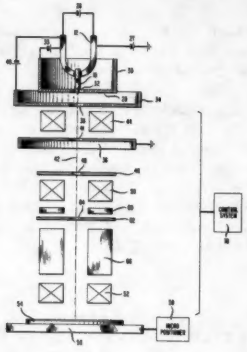
Int. Cl.[4] H01J *29/58*

U.S. Cl. 315—382 **25 Claims**

1. An emission system designed to provide a beam of electrons at a specified energy, said system comprising

an electron emitter of the thermal-field-emission type including a flat emissive end region,

and electrode means associated with said emitter for establishing with respect to the end region of said emitter, without changing said specified beam energy, electrostatic field forces that are opposite and at least approxi-



mately equal in value to the surface tension forces acting on said end region.

4,588,929

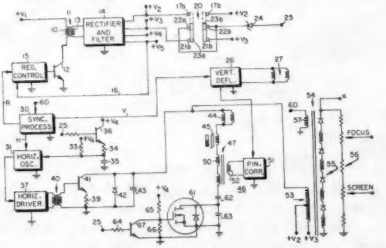
POWER SUPPLY AND DEFLECTION CIRCUIT PROVIDING MULTIPLE SCAN RATES

Werner F. Wedam, Lawrenceville; William E. Babcock, Warren, and Julian M. Schmoke, Jr., Plainsboro, all of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed May 25, 1983, Ser. No. 497,950

Int. Cl.[4] H01J *29/70, 29/56*

U.S. Cl. 315—395 **9 Claims**



1. A deflection circuit including linearity correction automatically adjusted for multiple scan rates for use in a video signal display system comprising:

a power supply selectively providing first and second supply voltages;

an oscillator producing an oscillator signal having a first frequency when said power supply produces said first supply voltage and producing said oscillator signal having a second frequency when said power supply produces said second supply voltage;

deflection means coupled to said oscillator for producing a deflection signal having a first deflection rate in response to said oscillator signal of said first frequency and a second deflection rate in response to said oscillator signal of said second frequency;

means for generating a bilevel signal having a first level indicative of said first deflection rate when said power supply provides said first supply voltage and having a second level indicative of said second deflection rate when said power supply provides said second supply voltage;

linearity correcting means incorporating a plurality of linearity-correction components; and

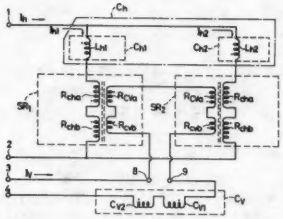
switching means coupled to said linearity correcting means and having a control terminal coupled to said bilevel signal generating means and responsive to said bilevel signal having said first level for coupling a first number of said linearity-correcting components to said deflection means in order to provide a first amount of linearity correction to said deflection signal and responsive to said bilevel signal having said second level for coupling a second number of said linearity-correcting components to said deflection means in order to provide a second amount of linearity correction to said deflection signal.

4,588,930

DEVICE FOR CORRECTING AN IMAGE ON A PICTURE TUBE HAVING IN-LINE ELECTRON GUNS AND A COIL ASSEMBLY FOR THE DEVICE

Toshio Kobayashi, Noda, and Hideo Hishiki, Iwai, both of Japan, assignors to Victor Company of Japan, Limited, Japan

Continuation of Ser. No. 387,434, Jun. 11, 1982, abandoned.
This application May 17, 1985, Ser. No. 735,353
Claims priority, application Japan, Jun. 14, 1981, 56-91275; Jul. 17, 1981, 59-111650; Jan. 7, 1982, 57-769
Int. Cl.[4] H01J *29/70*
U.S. Cl. 315—400 **33 Claims**



1. A device for correcting an image on a picture tube for use with an in-line type color picture tube of a self-convergence system, comprising first and second saturable rectors having H-shaped, open magnetic path-type cores, the reactors respectively connected in series with the horizontal deflecting coils of the deflecting yoke having two vertical deflecting coils so that a first series circuit including a first horizontal deflecting coil and said first saturable reactor and a second series circuit including a second horizontal deflecting coil and said second saturable reactor are formed, said first and second series circuits being connected in parallel such that a horizontal deflection driving current is applied across a parallel circuit of said first and second series circuits, each of said first and second saturable reactors being arranged so that the impedance thereof changes in opposite directions in accordance with the degree of the vertical deflection effected by said vertical deflecting coils.

4,588,931

TENSION CONTROL FOR WEB HANDLING APPARATUS

William J. Alexander, III, 41 W. Golden Strip Dr., Mauldin, S.C. 29662

Continuation of Ser. No. 454,699, Dec. 30, 1982, abandoned.
This application Aug. 6, 1984, Ser. No. 638,534
Int. Cl.[4] B65H *77/00, 75/10*
U.S. Cl. 318—7 **2 Claims**

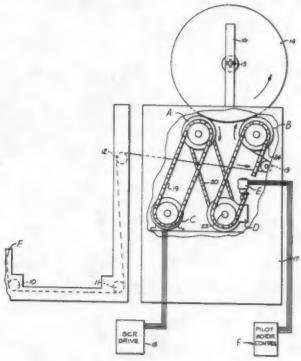
1. A web handling apparatus having a wound roll carried for surface winding by a pair of aligned driven rolls having a variable speed differential between them comprising:

an electric motor driving a first roll of said pair of driven rolls;

mechanical power transmission means driven by said first roll;

a pilot motor delivering a torque to said power transmission opposite to that of the first roll to reduce the output thereof to control the output of the power transmission;

means controlling the torque delivered by said pilot motor responsive to the tension in the web delivered to the wound roll to reduce the output in proportion to such tension; and



said power transmission means driving a second roll of said pair of driven rolls;

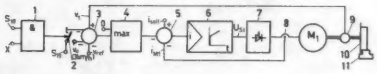
whereby a differential in speed between the first and second rolls is created wherein the speed of the second roll is slightly less than that of the first roll thus producing packing of the web wound by the second roll upon the wound roll by retarding passage of the web thereto.

4,588,932

SLIP-LIMITING CONTROL FOR RAIL VEHICLES

Pierre Riondel, Geneva, Switzerland, assignor to BBC Brown, Boveri & Company, Ltd., Baden, Switzerland

Filed Sep. 14, 1984, Ser. No. 650,501
Claims priority, application Switzerland, Sep. 28, 1983, 5251/83
Int. Cl.[4] B61C *15/08*; B60T *8/00*
U.S. Cl. 318—52 **8 Claims**



1. A method for limiting slip on a rail vehicle having at least two driving machines, wherein each driving machine is associated with a respective slip-limiting controller and in each slip-limiting controller a nominal current value (i_{soll}) is varied as a function of the difference between a peripheral wheel speed derived from a driving axle of the respective driving machine, and a presettable nominal slip limit value, comprising:

eliminating slipping between a driving wheel and a rail in the case of the driving wheels of at least one of said driving machines within a presettable short-term period (Δt_1):

presetting during a presettable long-term period (Δt_2) a speed reference value (v_{ref}) as a slip-limiting control value of each driving machine, said speed reference value (v_{ref}) corresponding to a very slow speed increase of the rail vehicle;

rapidly bringing the speed reference value (v_{ref}) to a minimum speed value, v_{min}, if $v_{ref} \neq v_{min}$, where v_{min} is equal

to the wheel circumferential speed of the slowest driving wheels; and

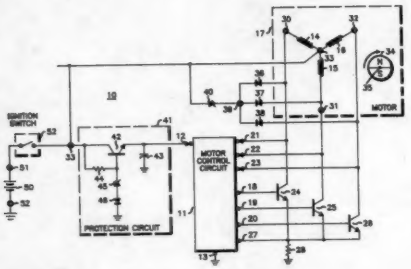
maintaining $v_{ref}=v_{min}$ until a further slipping occurs.

4,588,933

BRUSHLESS DIRECT CURRENT MOTOR CONTROL SYSTEM WITH PROTECTION CIRCUITRY

Koushun Sun, Elgin, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 13, 1984, Ser. No. 650,753
Int. Cl.[4] H02P 6/02
U.S. Cl. 318—254 **20 Claims**



1. A brushless direct current motor control system with protection circuitry comprising:

motor control means for receiving an input reference signal at an input terminal and also receiving a plurality of phase winding signals induced in associated motor phase windings by a varying magnetic field and for providing, in response to the effective comparison of said reference signal with said induced phase winding signals, cyclic and sequential phase winding motor drive signals as outputs to said associated motor phase windings, said induced phase winding signals varying about a predetermined variable reference signal level provided at a first terminal connected to said motor phase windings; and

protection circuit means coupled between said first terminal and said input terminal of said motor control means for receiving said predetermined reference signal level and providing in response thereto said input reference signal, the magnitude of said input reference signal normally tracking the magnitude of said predetermined variable reference signal, said protection circuit means comprising a transistor having first and second current conducting electrodes coupled between said first terminal and said input terminal of said motor control means and a resistor means coupled between one of said first and second electrodes and a control electrode of said transistor, said resistor means coupling operative voltage from said one of said first and second electrodes to said control electrode to maintain said transistor on.

4,588,934

AUTOMOBILE FAN CONTROL WITH NON-PERIODIC FLUCTUATION SIGNAL GENERATOR

Yasuhiko Suzuki, Nagoya, and Hideaki Ito, Aichi, both of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

Continuation of Ser. No. 452,767, Dec. 23, 1982, abandoned. This application Oct. 19, 1984, Ser. No. 662,618
Claims priority, application Japan, Dec. 26, 1981, 56-213594
Int. Cl.[4] H02P 7/06, 7/29
U.S. Cl. 318—449 **8 Claims**

1. An automobile fan controller comprising

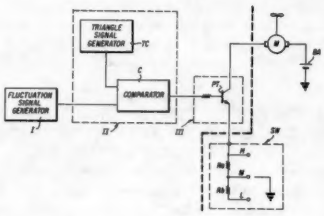
a fluctuation signal generator for generating a random fluctuation signal,

a pulse-width-modulation circuit including

a triangle signal generator for generating a triangle-waveform signal having a constant amplitude and a constant period, and

a comparator connected to said fluctuation signal generator and said triangle signal generator, for comparing the fluctuation signal with the triangle-waveform signal,

thereby producing a pulse signal having a pulse width variable dependent on the fluctuation signal, and



a driver circuit, including a switching power transistor connected to said pulse-width-modulation circuit, a fan motor mounted on an antomobile, and an air flow switching unit mounted on the automobile, for energizing and de-energizing said fan motor with a variable pulse width in response to the pulse signal,

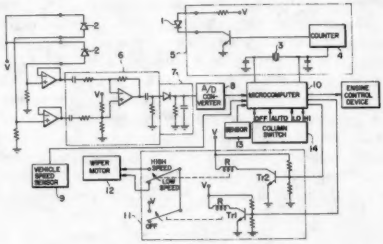
whereby air flow delivered from an automobile fan driven by said fan motor can fluctuate at a fluctuation amplitude in response to an air flow range set by an automobile driver by connecting the automobile fan controller to said fan motor.

4,588,935

METHOD FOR CONTROLLING AUTOMOBILE DEVICE WHEN SENSOR OUTPUT IS ABNORMAL

Toshiyuki Kaneiwa, Oobu, and Mamoru Shimamoto, Nagoya, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Dec. 26, 1984, Ser. No. 686,406
Claims priority, application Japan, Dec. 27, 1983, 252517
Int. Cl.[4] H02P 1/04
U.S. Cl. 318—483 **5 Claims**



1. A method of controlling the operation of an electrical device mounted on a vehicle equipped with a running condition sensor for sensing the running condition of said vehicle, said method comprising the steps of:

sensing a predetermined parameter required for the control of said electrical device by means of additional sensing means mounted on said vehicle;

discriminating whether said sensed predetermined parameter is within a normal range or an abnormal range;

controlling said electrical device in accordance with said sensed predetermined parameter when said parameter is discriminated to be within said normal range; and

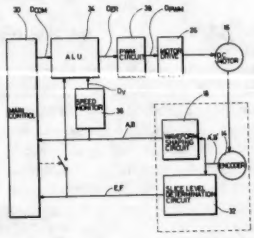
controlling said electrical device in accordance with an output of said running condition sensor when said sensed predetermined parameter is discriminated to be within said abnormal range.

4,588,936

DIGITALIZED POSITION CONTROL FOR A D.C. MOTOR

Hiromu Itoh, Nara; Zempei Tani, Tondabayashi, and Kenji Hachimura, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 31, 1984, Ser. No. 615,750
Claims priority, application Japan, Jun. 2, 1983, 58-99231; Jun. 6, 1983, 58-101225
Int. Cl.[4] G05B *11/18*
U.S. Cl. 318—594 5 Claims



1. A position control system for a D.C. motor comprising:

rotary encoder means for developing an approximate sinusoidal position indicating analog signal in response to the rotation of a D.C. motor;

slice level determination means for developing first and second sliced position indicating digital signals from said approximate sinusoidal position indicating analog signal;

logic control means for determining the position of the D.C. motor and the rotating direction of the D.C. motor in response to said first and second sliced position indicating digital signals developed from said slice level determination means; and

motor drive means for activating said D.C. motor in response to the determination conducted by said logic control means;

said slice level determination means comprising,

means for comparing said sinusoidal position indicating analog signal with a plurality of discrete voltages to develop a plurality of voltage attainment outputs, each representing that said sinusoidal position indicating analog signal has exceeded a said discrete voltage, and

means for combining said voltage attainment outputs to produce said first and second sliced position indicating digital signals, said first and second sliced position indicating digital signals comprising pulse signals; said logic control means comprising,

an up/down counter for developing coarse position signals for determining coarse position from said first and second sliced position indicating digital signals, and

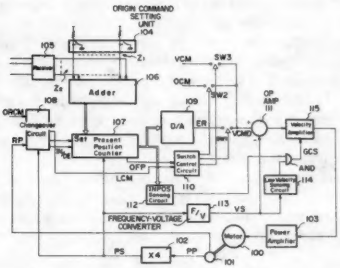
sliced position detection means for determining the position of said motor from said coarse position signals and said first and second sliced position indicating digital signals.

4,588,937

POSITION CONTROL APPARATUS

Yoshiki Fujioka, Yamato; Naoto Ota, Hino, and Mitsuhiko Hirota, Tokyo, all of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

PCT No. PCT/JP84/00187, § 371 Date Dec. 13, 1984, § 102(e) Date Dec. 13, 1984, PCT Pub. No. WO84/04182, PCT Pub. Date Oct. 25, 1984
PCT Filed Apr. 13, 1984, Ser. No. 683,017
Claims priority, application Japan, Apr. 13, 1983, 58-064916
Int. Cl.[4] G05F *1/00*
U.S. Cl. 318—677 6 Claims



1. A position control apparatus for a motor, comprising:

a servo control circuit for rotating the motor during normal servo control by following an offset between a commanded velocity and an actual velocity of the motor; and

an orientation control circuit for stopping the motor at a predetermined position upon receiving an orientation signal as the commanded velocity, said servo control circuit including:

a velocity amplifier having changeover means capable of making servo loop gain higher than that which prevails during the normal servo control; and

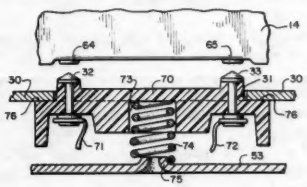
a low velocity sensing circuit, coupled to said velocity amplifier and the motor, for sensing a predetermined low velocity as the motor is being stopped, the servo loop gain being raised by the changeover means of said velocity amplifier in response to a signal from said low velocity sensing circuit when the rotational velocity of the motor drops to the predetermined low velocity during orientation control.

4,588,938

BATTERY CHARGER

James P. Liautaud, River and Bluff Rds., Trout Valley, Cary, Ill. 60013; Peter F. Stultz, Elgin, and David L. Maloney, Barrington, both of Ill., assignors to James P. Liautaud, Cary, Ill.

Filed Sep. 6, 1983, Ser. No. 529,709
Int. Cl.[4] H02J *7/00*
U.S. Cl. 320—2 4 Claims



1. A battery charger for supplying a charging current to a

battery-powered device having a pair of spaced-apart charge current receiving contacts on the bottom surface thereof, comprising:

a housing defining an interior chamber and a receptacle having side walls and a bottom wall opening to the exterior of said housing, and including at least one aperture in the bottom wall, for receiving the bottom surface of the battery-powered device;

circuit means within said interior chamber for producing a battery charging current;

contact means for establishing electrical communication between said circuit means and the contacts of the battery-powered device, said contact means including an electrically non-conductive contact carrier disposed within said interior chamber and movable relative to said bottom wall, and having a pair of non-resilient electrically-conductive contact members mounted in spaced relationship thereon, each of said contacts projecting through an aperture in the bottom wall of said receptacle and into mechanical engagement with respective ones of the charge current receiving contacts of the device when the device is seated in the receptacle; and

means comprising a spring for biasing said contact carrier toward said device, said spring engaging said carrier intermediate said contacts at one end and said housing at the other end.

4,588,939

CHARGING SYSTEM FOR A CAR

Iwaki Yoshiyuki, Himeji; Matsumoto Akio, and Yokota Mitsuyoshi, both of Hyogo, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

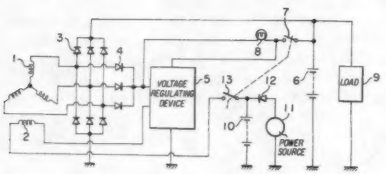
PCT No. PCT/JP83/00179, § 371 Date Jan. 27, 1984, § 102(e) Date Jan. 27, 1984

PCT Filed Jun., 1983, Ser. No. 576,387

Claims priority, application Japan, Jun. 3, 1982, 57-83721[U]

Int. Cl.⁴ H02J *7/14;* H02P *9/10*

U.S. Cl. 322—88 **3 Claims**



1. A charging system for a car which suppresses surge voltages in the output, comprising:

A generator having an armature coil for producing an alternating output and a field coil facing said armature coil;

a rectifying device for rectifying said alternating output to produce a rectified output voltage;

a voltage regulating device for controlling said rectified output voltage by controlling the field current in said field coil;

a battery charged with the rectified output from said generator;

a first switch for connecting said voltage regulating device and said battery;

a power source independent of said battery and independent of said rectified output voltage, connected to one side of said field coil for supplying the entire field current to said field coil; and

a second switch mechanically connected to said first switch so as to be operated concurrently therewith, said second switch connecting said power source to said field coil;

wherein the operation of said voltage regulating device does not produce a surge voltage in said rectified output.

4,588,940

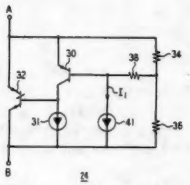
TEMPERATURE COMPENSATED SEMICONDUCTOR INTEGRATED CIRCUIT

Milton L. Embree, Reading, and Elizabeth E. Perry, Wyomissing, both of Pa., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 23, 1983, Ser. No. 564,703

Int. Cl.⁴ G05F *3/22*

U.S. Cl. 323—313 **11 Claims**



1. A temperature compensation circuit for increasing the inherent negative temperature coefficient associated with a bipolar junction transistor (30), said compensation circuit comprising

a first resistor (38) connected to the base of said bipolar junction transistor;

a second resistor (34) connected between said first resistor and the emitter of said bipolar junction transistor;

a third resistor (36) connected between said second resistor and a predetermined reference potential; and

a current source (41) connected to the base of said bipolar junction transistor for providing a voltage across said first resistor which increases the normalized negative temperature coefficient of the voltage at the junction of said second and third resistors to a value above that of the base to emitter voltage of said bipolar junction transistor.

4,588,941

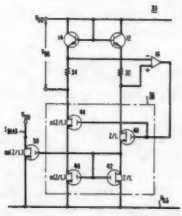
CASCODE CMOS BANDGAP REFERENCE

Donald A. Kerth, Reading-Comru Township, Berks County, and Navdeep S. Sooch, Emmaus, both of Pa., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Feb. 11, 1985, Ser. No. 700,600

Int. Cl.⁴ G05F *3/20*

U.S. Cl. 323—314 **4 Claims**



1. A voltage reference circuit for providing as an output a bandgap reference voltage which is substantially independent of temperature, said reference circuit comprising

differential amplifying means including a first and a second input terminal and an output terminal;

a first bipolar transistor including a collector, a base, and an emitter, the collector and base connected to a first reference potential, said first bipolar transistor having a base to emitter voltage defined as V_{BE};

a second bipolar transistor including a collector, a base, and an emitter, the collector and base connected to said first

reference potential and the emitter connected to said first input terminal of said differential amplifying means;

a first resistor connected between the emitter of said first transistor and said second input terminal of said differential amplifying means;

a second resistor connected to the emitter of said second bipolar transistor; and

an MOS cascode transistor arrangement connected in series between said first and second resistors and a second reference potential and further connected to the output terminal of said differential amplifying means, said MOS cascode transistor arrangement including

a first plurality of MOS transistors, each MOS transistor having a source, drain and gate terminal and formed to comprise a width-to-length ratio defined as Z/L, said first plurality of MOS transistors connected between said first resistor and said second reference potential; and

a second plurality of MOS transistors, each MOS transistor having a source, drain and gate terminal and formed to comprise a width-to-length ratio defined as n(Z/L), n being defined as a width-to-length size factor, said second plurality of MOS transistors connected between said second resistor and said second reference potential, said MOS cascode transistor arrangement providing the output bandgap reference voltage which is proportional to the sum of said base-to-emitter voltage of said first transistor and the ratio of said second and first resistors multiplied by both said size factor n and the difference in base-to-emitter voltages of said first and second transistors.

4,588,942

THICKNESS MONITORING SYSTEM FOR INTERMITTENTLY EXPOSING A QUARTZ CRYSTAL TO A MATERIAL TO BE DEPOSITED

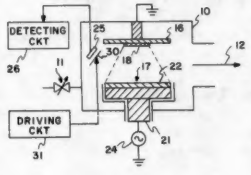
Hiroaki Kitahara, Tokyo, Japan, assignor to Anelva Corporation, Tokyo, Japan

Filed Jun. 10, 1983, Ser. No. 503,041

Claims priority, application Japan, Jun. 11, 1982, 57-100416

Int. Cl.[4] G01N *27/07*; C23C *14/52*

U.S. Cl. 324—71.5 **5 Claims**



1. A thickness monitoring system for use in combination with a layer forming device which deposits a desired layer on a substrate in a hollow space filled with a gas, said thickness monitoring system being positioned for monitoring a thickness of said layer during the deposition thereof, said layer forming device comprising a first electrode member on which said substrate is supported in said hollow space, a second electrode member within said hollow space which is directed toward said first electrode member, and means for supplying an a.c. electrical voltage between said first and said second electrode members, said monitoring system comprising:

a quartz crystal which is covered in said hollow space with a monitoring layer of a variable thickness and which produces an electrical signal having a frequency which is variable in correspondence to the thickness of said monitoring layer;

exposing means in said hollow space for periodically exposing said quartz crystal to said second electrode member during each of a plurality of first time intervals, with said quartz crystal being shielded from said second electrode member during second time intervals which are interposed between two adjacent ones of said first time intervals; and

thickness measuring means responsive to said electrical signal for periodically and successively measuring the thickness of said desired layer only during each of said second time intervals, said measuring being made with reference to the thicknesses of said monitoring layer which was formed during each of said first time intervals.

4,588,943

INSTRUMENT FOR MEASURING THE MOISTURE CONTENT OF DIELECTRIC OBJECTS

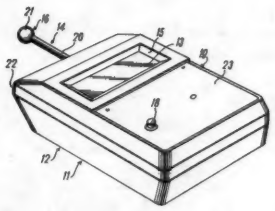
Friedrich Hirth, Stuttgart, Fed. Rep. of Germany, assignor to Gann Mess-u. Regeltechnik GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 6, 1984, Ser. No. 597,360

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1983, 3331305

Int. Cl.[4] G01R *27/26*

U.S. Cl. 324—61 P **15 Claims**



1. An instrument for measuring moisture content, particularly the moisture content of dielectric solids, comprising support means; and capacitance measuring means mounted on said support means and including a capacitance measuring circuit having first and second terminals for connection with respective electrodes which cooperate to cause the generation of measuring signals during moisture determination, said capacitance measuring means further including an active first electrode which is connected with said first terminal and contacts the object whose moisture content requires determination, and said capacitance measuring means being devoid of a cooperating electrode for said first electrode, said second terminal being designed for connection with ground which constitutes a second electrode during moisture determination and cooperates with said first electrode, without touching the object which is contacted by said first electrode, to cause the generation of measuring signals.

4,588,944

FULLY SCAN-SET TESTABLE EMBEDDED EDGE-TRIGGERED DUAL D AND J-K FLIP-FLOPS THROUGH TESTING AS INVERTER STRINGS

Roland D. Rothenberger, Apple Valley, Minn., assignor to Sperry Corporation, New York, N.Y.

Filed Jun. 13, 1983, Ser. No. 503,960

Int. Cl.[4] G01R *31/28*; H03K *19/00*

U.S. Cl. 324—73 R **7 Claims**

1. An extended and expanded improved testing method to that scan-set testing of an edge-triggered flip-flop which, by the interconnection of some of the NAND gate logic elements thereof said flip-flop, does exercise said elements as a race-free bistable flip-flop during scan-set testing responsively to an active scan-set first test enablement signal, called TEST 1, plus active test clock signals, called SS CLK A and SS CLK B, to shift the scan-set test data signal input, called SS DATA IN, to a scan-set test data signal output, called SS DATA OUT, said improved testing method, to the end that remaining ones of the

NAND gate logic elements of said edge-triggered flip-flop should also be tested, comprising:

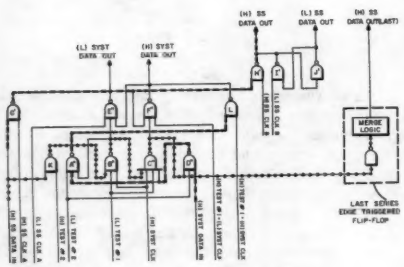
identifying those serially interconnected first NAND gates of the edge-triggered flip-flop logic structure which were disabled, and were therefore untestable, by said active condition of said first test enablement signal, said signal TEST 1, during said scan set-testing;

causing said first test enablement signal, said signal TEST 1, to assume the inactive condition in partial enablement of those said serially interconnected first NAND gates which had been previously disabled during said scan-set testing;

identifying those second NAND gates which are cross-coupled with any one or ones of said serially interconnected first NAND gates, said cross-coupling meaning that when said second NAND gates are operative then the active signal outputs therefrom will be received at the signal inputs to any one or ones of said serially interconnected first NAND gates;

applying the active condition of a second test enablement signal, called TEST 2, in order to disable said second NAND gates;

gating in a third NAND gate the active scan-set test data signal input, said SS DATA IN, with said active second



test enablement signal, said TEST 2, in order to produce a second-test stimuli signal;

applying said second-test stimuli signal in partial enablement of the first of said serially interconnected first NAND gates;

allowing an actively cycling system clock signal, called SYST CLK, received at said serially interconnected first NAND gates, to clock said second-test stimuli signal through both said serially interconnected first NAND gates;

merging said clocked second-test stimuli signal upon the output of the last of said serially interconnected first NAND gates into, and becoming as, said test data signal output, said SS DATA OUT;

whereby said serially interconnected first NAND gates which were disabled, and therefore untestable, during said scan-set testing are enabled and interconnected between said test data signal input, said SS DATA IN, and said test data signal output, said SS DATA OUT, during the active condition of said second test enablement signal, said TEST 2, and said actively cycling system clock signal, said SYST CLK;

whereby said serially interconnected first NAND gates are tested.

4,588,945

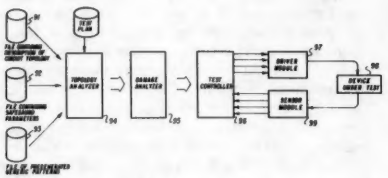
HIGH THROUGHPUT CIRCUIT TESTER AND TEST TECHNIQUE AVOIDING OVERDRIVING DAMAGE

William A. Groves; Vance R. Harwood, both of Loveland; Thomas R. Fay, Fort Collins; Elton C. Bingham, and Michael A. Teska, both of Loveland, all of Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jun. 13, 1983, Ser. No. 503,465

Int. Cl.[4] G01R *15/12*

U.S. Cl. 324—158 R **8 Claims**



1. An improved method of testing circuits consisting of devices of the type in which test signals are applied directly to each device under test and output signals from each device under test are monitored, wherein the improvement comprises the additional step of introducing, between the application of test signals for each device, a predetermined variable length cool down time interval determined from characteristics of the devices and the circuit sufficient to avoid damage to the circuit due to overheating of devices of the circuit.

4,588,946

METHOD FOR MEASURING CURRENT AT A P-N JUNCTION

Paul S. Lin, Berkeley Heights, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 30, 1983, Ser. No. 567,349

Int. Cl.[4] G01R *31/26, 19/08*

U.S. Cl. 324—158 D **5 Claims**

1. A method of measuring the current distribution at a p-n junction within a semiconductor device comprising the steps of:

scanning a beam of radiation across the p-n junction;

measuring the current produced by the absorption of said beam of radiation, I;

determining the electrostatic potential difference across the junction; and

using the Shockley relation to determine the device current density, J.

4,588,947

INTEGRATED MINIATURE DC SQUID SUSCEPTOMETER FOR MEASURING PROPERTIES OF VERY SMALL SAMPLES

Mark B. Ketchen, Ossining, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1983, Ser. No. 567,302

Int. Cl.[4] G01R *33/16, 33/035*

U.S. Cl. 324—201 **21 Claims**

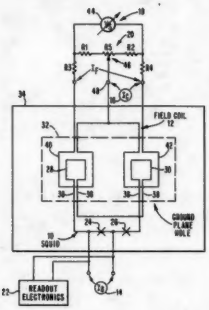
1. A SQUID susceptometer for measuring properties of a very small sample, comprising:

a dc SQUID including at least two Josephson switching elements in a closed current electrical circuit, said circuit also including pick-up loops located remotely from said Josephson switching elements, said sample to be measured to be placed in one of said pick-up loops,

a field coil for providing a magnetic field in said pick-up loops, there being at least a single turn of said field coil around each said pick-up loop wherein an electrical cur-

rent in the turns of said field coil produces a magnetic field in said pick-up loops,

said dc SQUID and said field coil being comprised of planar thin film structures integrated on a single superconducting chip and wherein a signal due to said sample is coupled



directly to said SQUID via said pick-up loop in which said sample is placed and,

bias means connected to said SQUID for providing electrical currents in said SQUID for adjusting the operating point of said SQUID.

4,588,948

NUCLEAR MAGNETIC RESONANCE METHODS

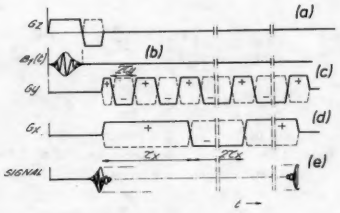
Peter Mansfield, 15 Devonshire Avenue, Beeston, Nottingham, England

Filed Oct. 4, 1983, Ser. No. 538,977

Claims priority, application United Kingdom, Oct. 6, 1982, 8228567

Int. Cl.[4] G01R *33/22*

U.S. Cl. 324—309 **5 Claims**



1. A method of investigating a body by NMR comprising the steps of: exciting resonance in a selected slice of the body; subsequently applying a magnetic field to said body having first and second gradients in different directions in said slice, both said gradients being periodically reversed at regular intervals with their periods of reversal being coordinated such that the period of reversal of one of said gradients is a multiple of the period of reversal of the other of said gradients; detecting the free induction decay signals occurring when said gradients are applied; and processing the detected signals to retrieve data.

4,588,949

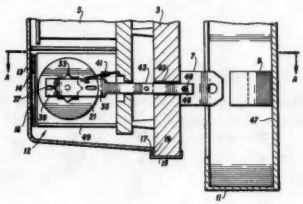
METER REMOVAL INDICATOR

Dale F. Becker, and Norman B. Venzas, both of Seneca, S.C., assignors to Sangamo Weston, Inc., Norcross, Ga.

Filed Sep. 16, 1983, Ser. No. 532,888

Int. Cl.[4] G01R *11/24*; G08B *13/06*; G09F *9/00*

U.S. Cl. 324—110 **21 Claims**



1. In apparatus for measuring a quantity, the measuring apparatus being removably mounted to a socket,

means for detecting movement of the measuring apparatus relative to the socket, comprising:

a unidirectional register mounted to the measuring apparatus, the register capable of displaying at least one of a plurality of markings and arranged to be no longer operative upon displaying a predetermined one of the markings; and

means for actuating the register having a first portion connected to the register and a second portion engaging the socket, the actuating means being responsive to movement of the measuring apparatus relative to the socket so as to cause the displayed register markings to change to thereby give an indication of such movement.

4,588,950

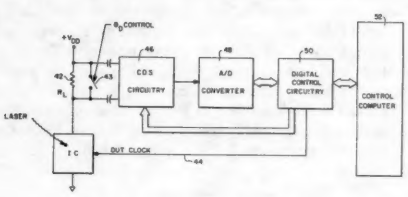
TEST SYSTEM FOR VLSI DIGITAL CIRCUIT AND METHOD OF TESTING

Francois J. Henley, Mountain View, Calif., assignor to Data Probe Corporation, Santa Clara, Calif.

Filed Nov. 15, 1983, Ser. No. 552,089

Int. Cl.[4] G01R *31/28*

U.S. Cl. 324—158 R **7 Claims**



4. Test apparatus for high speed logic state analysis by determining the conduction state of a transistor in a digital semiconductor integrated circuit operating at a clock rate in excess of one megahertz comprising

power supply means,

load means connecting said power supply means with a semiconductor integrated circuit undergoing test,

switch means for electrically bypassing said load means,

laser means for selectively irradiating a transistor in said semiconductor integrated circuit,

clock means for applying a clock signal to said semiconductor integrated circuit,

differential amplification means,

capacitive means for capacitively coupling said load means to said differential amplification means, and

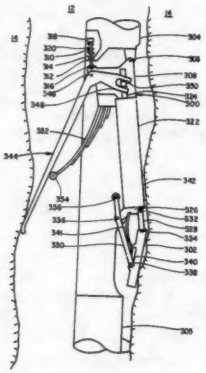
control means for stopping said clock means at a predetermined state time, deactivating said switch means for bypassing said load means, thereafter irradiating a transistor in said semiconductor integrated circuit, and differentially amplifying the voltage across said load means.

4,588,951

ARM APPARATUS FOR PAD-TYPE LOGGING DEVICES

Hervé Ohmer, Vorgius le Bretomeux, France, assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Jul. 6, 1983, Ser. No. 511,412
Int. Cl.[4] G01V *3/20*; E21B *47/00, 49/00*
U.S. Cl. 324—367 **6 Claims**



1. A well logging sonde comprising:

an elongate body adapted for displacement along a borehole;

a measuring pad adapted for engagement with the wall of the borehole;

an arm device carrying said pad and pivotally connected to said body to allow lateral extension of said pad;

a backup arm pivotally mounted on said arm device

resilient means operatively connected between said arm device and said backup arm for biasing said backup arm outwardly of said body into engagement with the borehole wall in diametrical opposition to said pad; and

actuator means mounted on said arm device, said actuator having a displaceable member operatively connected to said backup arm to pivot said backup arm against action of said resilient means.

4,588,952

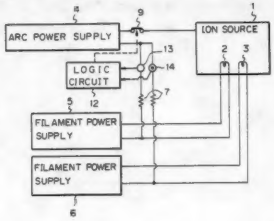
ARC DISCHARGE ABNORMALITY DETECTING SYSTEM

Mamoru Matsuoka, Ibaraki, Japan, assignor to Japan Atomic Energy Research Institute, Tokyo, Japan

Filed Dec. 12, 1983, Ser. No. 560,869
Claims priority, application Japan, Dec. 16, 1982, 57-220555
Int. Cl.[4] G01R *31/024*
U.S. Cl. 324—409 **6 Claims**

1. A method for detecting arc discharge abnormality when generating source plasma by means of an arc discharge using a plurality of filaments as the cathode in an ion source, comprising the steps of:

detecting an arc discharge current flowing in each of the filaments, and



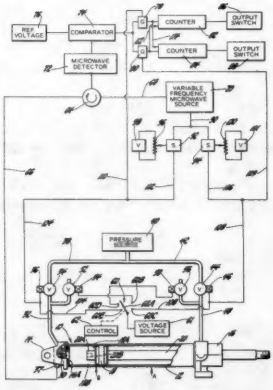
detecting an abnormality in the arc discharge when the arc discharge currents are not balanced.

4,588,953

MICROWAVE PISTON POSITION LOCATION

Mark K. Krage, Royal Oak, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 11, 1983, Ser. No. 522,105
Int. Cl.[4] G01R *27/04*
U.S. Cl. 324—58.5 C **6 Claims**

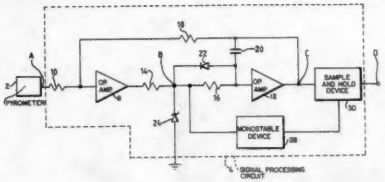


1. A method of determining the position of a piston movable in a cylinder of a hydraulic actuator, the steps comprising, applying a microwave signal to a cavity defined by the piston and the interior of said cylinder and detecting a reflected microwave signal while the piston is being moved in the cylinder by the application of fluid pressure to the cylinder, repeatedly varying the frequency of the microwave signal applied to the cavity between two values that are of such a magnitude that the reflected microwave signal has one or more resonant amplitude variations the number of which are a function of the position of the piston relative to an end of said cylinder, developing data from said reflected microwave signal that is indicative of the number of resonant amplitude variations that occur and the frequency of the microwave signal applied to the cavity at the time at least one of said resonant amplitude variations occurred and converting said data to piston position information.

4,588,954
APPARATUS FOR PROCESSING OF PYROMETER SIGNALS

Stephen R. Seymour, Bristol, England, assignor to Rolls-Royce Limited, London, England

Filed Mar. 30, 1983, Ser. No. 480,376
Claims priority, application United Kingdom, Apr. 13, 1982, 8210702
Int. Cl.⁴ H03K *5/08, 5/153*
U.S. Cl. 328—151 **3 Claims**



1. A circuit for processing a pyrometer output signal, the circuit comprising:

rate limiting means for receiving the pyrometer output signal and for deriving therefrom a rate-limited representation thereof and a signal representing a rate of increase thereof;

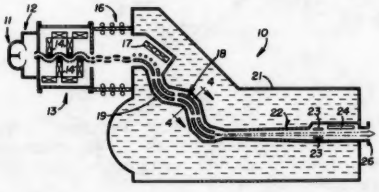
sample and hold means for sampling said rate-limited representation and for producing an output signal whose value is held equal to the last sampled value of said rate-limited representation; and

triggering means for receiving the signal representing the rate of increase of the pyrometer output signal as a control input and for repeatedly triggering the sample and hold means to sample said rate-limited representation when the rate of increase of the pyrometer output signal is below a predetermined rate, and for preventing said triggering when the rate of increase of the pyrometer output signal exceeds said predetermined rate.

4,588,955
TRANSVERSE FIELD FOCUSED SYSTEM

Oscar A. Anderson, Berkeley, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 1, 1983, Ser. No. 500,105
Int. Cl.⁴ H01J *23/00*
U.S. Cl. 328—233 **5 Claims**



1. In a sheet beam system of charged particles, a transverse field focused system comprising:

a plurality of pairs of spaced-apart inner and outer electrodes having concentric cylindrical-arc electrode surfaces with entry and exit edges parallel to the axis of curvature of said electrodes and side edges in planes perpendicular to said axis of curvature,

said pairs of electrodes being arranged in serial manner with the exit edges of a pair of electrodes being spaced from and generally in line with the entry edges of the next pair of electrodes,

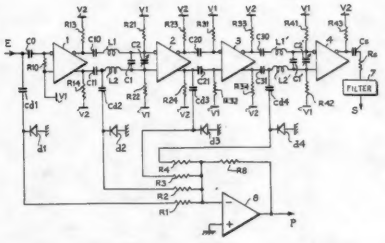
means for impressing voltages on the electrodes of each pair thereof to create an electric field between said electrodes to guide said sheet beam of charged particles from the entry edges of said electrodes to the exit edges thereof and along a curved surface between said electrodes, the mean voltage on successive pairs of electrodes being progressively greater, and

wherein both side edges of both electrodes of each pair thereof are bent toward the axis of curvature of said electrode surfaces to focus the beam edges.

4,588,956
WIDE BAND AMPLIFIER-LIMITER DEVICE

Patrick de Corlieu, and Jacques Bursztejn, both of Paris, France, assignors to Alcatel Thomson Faisceaux Hertziens, Levallois Perret, France

Filed Nov. 21, 1984, Ser. No. 673,936
Claims priority, application France, Nov. 25, 1983, 83 18849
Int. Cl.⁴ H03F *3/68*
U.S. Cl. 330—2 **5 Claims**

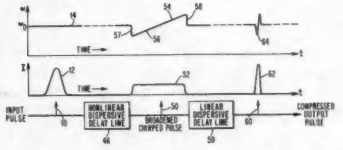


1. An amplifier-limiter device which comprises: a signal input and a signal output, 2n integrated logic circuits of the line receiver emitter coupled type (n being an integer at least equal to 1), 2n+1 connections for establishing a coupling in series of the 2n circuits between the signal input and output, these 2n circuits forming n pairs of successive and separate circuits, and n compensating feedback circuits associated with the n pairs respectively, for compensating the linear distortion caused by the n pairs and for having band pass above 100 mHz.

4,588,957
OPTICAL PULSE COMPRESSION APPARATUS AND METHOD

Anne C. Balant, Mahopac, and Daniel R. Grischkowsky, Peekskill, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 9, 1982, Ser. No. 386,492
Int. Cl.⁴ G02F *1/16*
U.S. Cl. 330—4.3 **25 Claims**



1. Apparatus for compressing an optical pulse, comprising:

a nonlinear dispersive optical delay line receiving the input optical pulse to be compressed, said nonlinear delay line having a group velocity dispersion and nonlinear index of refraction with the same sign, said nonlinear index of refraction producing self-phase modulation which interacts with group velocity dispersion to produce an interme-

diate pulse at the output of said nonlinear delay line which is broader than said input pulse and has linear frequency chirp; and

a linear dispersive optical delay line receiving said intermediate pulse, said linear delay line having a group velocity dispersion of opposite sign from the group velocity dispersion of said nonlinear delay line and of sufficient magnitude to compress said intermediate pulse to a width less than said input optical pulse.

4,588,958

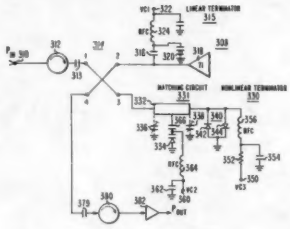
ADJUSTABLE REFLECTIVE PREDISTORTION CIRCUIT

Allen Katz; Rajagopalan Sudarsanam, both of Mercer County, and Donald E. Aubert, Camden County, all of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Mar. 29, 1985, Ser. No. 717,877

Int. Cl.[4] H03F *1/32*

U.S. Cl. 330—149 **21 Claims**



6. A predistortion arrangement, comprising:

an amplifier exhibiting nonlinearity of its output signals at a desired output signal level, and having a gain which together with said desired output level defines a desired input signal level, and also being characterized for operation at a predetermined input and output impedance level;

a circuit coupled to said amplifier for generating an input signal at said input signal level, including a two-terminal device having a nonlinear transfer characteristic, said nonlinear transfer characteristic including a first region exhibiting nonlinearity less than that of said amplifier at said desired output level, a second region exhibiting nonlinearity substantially equal to that of said amplifier at said desired output level, and a third region exhibiting nonlinearity greater than that of said amplifier of said desired output level, said nonlinear device operating in one of said first and third regions when driven from said predetermined impedance level to produce said input signal at said input signal level; and

signal transforming means coupled to said device for setting the signal level across said device during operation to produce said input signal at said input signal level to establish operation in said second region.

4,588,959

HUM NEUTRALIZATION CIRCUIT

William E. Herzog, and John H. Atkins, both of Rochester, N.Y., assignors to Harris Corporation, Melbourne, Fla.

Filed Jul. 12, 1984, Ser. No. 630,185

Int. Cl.[4] H03F *1/30*

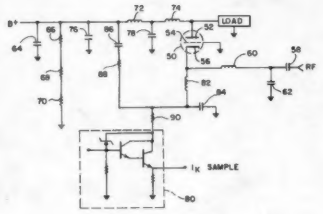
U.S. Cl. 330—149 **8 Claims**

1. An RF amplifier circuit in which variations in the output signal of the RF amplifier caused by variations in a DC supply voltage energizing said amplifier are substantially neutralized, comprising:

a triode RF amplifier having it anode electrode energized by said DC supply voltage, it grid electrode grounded and its cathode electrode electrically connected to a source for an RF signal to be amplified;

a DC blocking capacitor electrically connected to said DC supply voltage to provide a variation voltage signal substantially similar to the variations in said DC supply voltage;

a plurality of serially-connected resistors connected as a voltage divider between said DC blocking capacitor and the cathode electrode to attenuate said variation voltage signal by an amount related to the amplification of said amplifier; and



means for applying the attenuated variation voltage signal to the cathode electrode of said RF amplifier so that the output signal appearing at the anode electrode due to the amplified attenuated variation voltage signal is equal in amplitude and opposite in phase to the variations in the DC supply voltage, whereby the variations in the DC supply voltage are substantially neutralized.

4,588,960

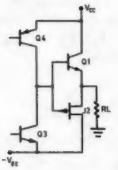
OUTPUT CIRCUITS OF CLASS B TYPE ELECTRONIC AMPLIFIERS

Clement A. Salama, and Satwinder D. Malhi, both of Toronto, Calif., assignors to University of Toronto Innovations Foundation, Ontario, Canada

Continuation of Ser. No. 344,415, Feb. 1, 1982, abandoned. This application Aug. 3, 1984, Ser. No. 637,630

Int. Cl.[4] H03F *3/30*

U.S. Cl. 330—264 **7 Claims**



1. In an output stage for use with an amplifier biased to operate in a class B mode, the output stage being connected between means to drive the output stage and a load, the improvement comprising

a bipolar transistor operative to have a base-emitter voltage drop of a first value,

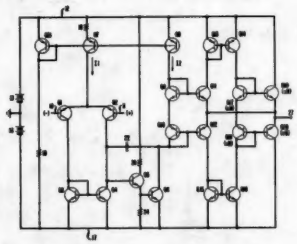
a field effect transistor operative to have a gate-source pinch-off voltage drop of a second value, the base of the bipolar transistor being coupled to the gate of the field effect transistor and the emitter of the bipolar transistor being coupled to the source of the field effect transistor, the value of the base-emitter voltage drop of the bipolar transistor and the value of the gate-source pinch-off voltage drop of the field effect transistor being selected to be substantially equal to minimise the deadband voltage in the voltage transfer characteristics of the output stage.

4,588,961

AMPLIFIER WITH EXTENDED OUTPUT DRIVE CAPABILITY

Madana K. N. Rao, North Plainfield, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 24, 1984, Ser. No. 644,119
Int. Cl.⁴ H03F *3/26*
U.S. Cl. 330—267 **8 Claims**



1. An amplifier having a first push-pull amplification output stage for controlling output current level in a first output current path therein between power supply rails and including an output terminal, said amplifier comprising

means for mirroring current in said first output current path to produce a mirrored current,

at least a second push-pull amplification output stage for controlling output current level in a second current path therein between said supply rails, said second current path including said output terminal, and

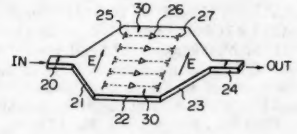
means, responsive to said mirrored current, for current biasing said second amplification stage to produce further amplified current in said second current path and said output terminal.

4,588,962

DEVICE FOR DISTRIBUTING AND COMBINING MICROWAVE ELECTRIC POWER

Toshiyuki Saito, Kawasaki; Yasuyuki Tokumitsu, Isehara; Naofumi Okubo, Kawasaki; Yoshimasa Daido, Yokohama, and Hiroshi Kurihara, Tokyo, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed May 27, 1983, Ser. No. 498,658
Claims priority, application Japan, May 31, 1982, 57-92389; Jun. 14, 1982, 57-101783; Jun. 28, 1982, 57-109911; Jun. 29, 1982, 57-110627
Int. Cl.⁴ H03F *3/60*
U.S. Cl. 330—286 **113 Claims**



1. A device for distributing and combining microwave electric power, comprising:

a first microwave path;

a plurality of second microwave paths each including an MIC transmission line, a waveguide/MIC converting element coupled to said MIC transmission line, and a planar dielectric substrate on which at least a portion of said second microwave paths being formed;

an electromagnetic horn having a rectangular cross-section, a throat portion coupled to said first microwave path and an opening portion for transmitting a microwave signal;

an oversized rectangular waveguide coupled to the opening portion of said horn at one end, the other end of said oversized waveguide being coupled to said plurality of second microwave paths; and

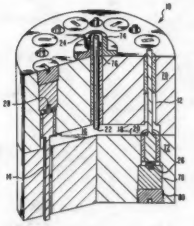
phase compensating means for uniformalizing the phase and the magnitude of the microwave signal distributed by said horn or for adjusting the phases of microwave signals output from said plurality of second microwave paths therein, said phase compensating means being located at a coupling portion from said horn to said oversized waveguide, said phase compensating means comprising a dielectric lens comprising a dielectric substance.

4,588,963

MICROWAVE POWER COMBINER WITH ALTERNATING DIODE MODULES

Robert L. Eisenhart, Woodland Hills, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 20, 1983, Ser. No. 564,787
Int. Cl.⁴ H03B *5/00*
U.S. Cl. 331—56 **20 Claims**



1. A microwave power combiner comprising:

a fundamental mode combining cavity defined by top and bottom walls and a periphery and having a central axis at the center of the periphery;

at least three coaxial oscillator circuits, each circuit comprising an oscillator diode and a coupling port coupled to the oscillator diode, the oscillator circuits disposed on an equi-potential line of the cavity and disposed such that the coupling port of each oscillator circuit electrically couples with the cavity, and the individual coaxial oscillator circuits of the plurality are further disposed such that the adjacent oscillator circuits on the equi-potential line have their respective oscillator diode disposed in a different one of the top and bottom walls; and

output means for conducting the power combined in the cavity out of the cavity.

4,588,964

HERMETICALLY SEALED MICROWAVE SOLID-STATE OSCILLATOR WITH DIELECTRIC RESONATOR TUNED BY ELECTROMAGNETICALLY COUPLED TERMINATING ADMITTANCE

Kenji Hirai, Yokohama, and Hideki Torizuka, Kawasaki, both of Japan, assignors to Kabushiki Kaisha Toshiba, Tokyo, Japan

Filed Oct. 10, 1984, Ser. No. 660,002
Claims priority, application Japan, Dec. 26, 1983, 58-244300
Int. Cl.⁴ H03B *1/04, 7/00*
U.S. Cl. 331—67 **11 Claims**

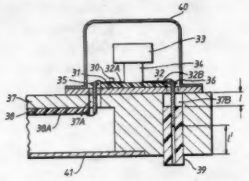
1. A microwave solid-state oscillator for producing an oscillation output, said oscillator comprising:

a microwave oscillation device circuit;

a dielectric resonator electromagnetically coupled with said microwave oscillation device circuit;

a casing comprised of a cap and a stem for hermetically enclosing said microwave oscillation device circuit and said dielectric resonator;

an output terminal for said oscillation output leading out from said casing, said terminal having an end positioned within said casing, said end being electromagnetically coupled to said dielectric resonator; and



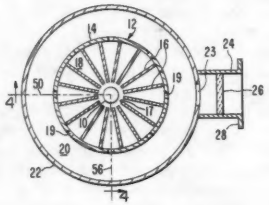
a microwave line comprised of an inner portion positioned within said casing, said inner portion being electromagnetically coupled to said dielectric resonator and an outer portion positioned out of said casing said outer portion including an adjustable terminating admittance means for adjusting said output of said oscillator.

4,588,965

COAXIAL MAGNETRON USING THE TE_{111} MODE

Alfred W. Cook, Andover, Mass., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Jun. 25, 1984, Ser. No. 623,896
Int. Cl.[4] H03B *9/10*
U.S. Cl. 331—91 **11 Claims**



1. A magnetron oscillator comprising:

a generally cylindrical electron-emitting cathode,

an anode insulated from and surrounding said cathode, the inner surface of said anode facing said cathode being generally a cylinder coaxial with said cathode, said anode having a plurality of gaps parallel to the axis of said cylinder, a plurality of resonant chambers in said anode in wave-transmissive connection with said gaps,

a resonant cavity surrounding said anode,

a plurality of apertures in the wall between alternate ones of said chambers and said cavity for mutual coupling,

means for extracting electromagnetic wave energy from said cavity, and

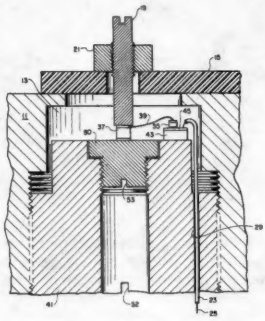
means for causing said cavity to resonate at approximately the resonate frequency of said anode chambers in an operating mode having electric field perpendicular to said axis, one cyclic variation of said electric field strength over a path going around said anode, and one cyclic variation over a path going across said cavity generally parallel to said axis.

4,588,966

IMAGE LINE VOLTAGE CONTROLLED OSCILLATOR WITH REPLACEABLE COMPONENTS

Robert E. Horn, Middletown, N.J.; Harold Jacobs, deceased, late of West Long Branch, N.J. (by Lydia S. Jacobs, executrix), and Hsieh T. Hao, Rumson, N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 10, 1984, Ser. No. 679,971
Int. Cl.[4] H03B *5/18*
U.S. Cl. 331—96 **7 Claims**



1. An oscillator comprising, in combination

a housing having a resonating cavity;

a solid state mechanically tunable element adjustably disposed interiorly of said housing and extending contentrically through said cavity, capable of producing a waveform energy output of a frequency relative to its position in said resonating cavity;

a solid state electronically tunable element in circuit with and mounted proximally of said mechanically tunable element;

position adjustment means on said mechanically tunable element operably accessible exteriorly of said housing;

electrical bias sources operably connected respectively to each of the said tunable elements;

bias variation control means to controllably vary the bias on at least the solid state electronically tunable element; and

millimeter wave length conductive circuit means arrayed and disposed to conduct generated waveform energy exteriorly of the oscillator.

4,588,967

INTEGRATED VARACTOR TUNED COAXIAL GUN OSCILLATOR FOR 60 GHZ OPERATION

Robert E. Horn, Middletown, N.J., and Harold Jacobs, deceased, late of West Long Branch, N.J. (by Lydia S. Jacobs, executrix), assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 10, 1984, Ser. No. 679,974
Int. Cl.[4] H03B *7/12*
U.S. Cl. 331—107 G **7 Claims**

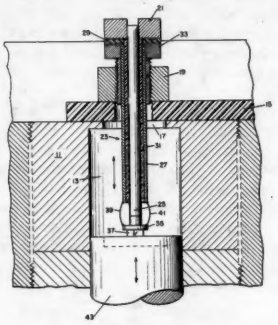
1. An oscillator comprising, in combination; a housing having a resonating cavity;

a solid state mechanically tuneable element adjustably disposed in said housing extending concentrically through said resonating cavity, and capable of producing a wave form energy output of a frequency relative to its position in said resonating cavity;

a solid state electronically tuneable element in circuit with and arranged and disposed concentrically with the mechanically tunable element;

position adjustment means exterior of said housing operably connected to said mechanically tuneable element;

mechanical connecting means between the mechanically tunable element and said position adjustment means; and



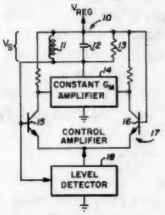
electrical bias sources operably connected respectively to each of the said tuneable elements.

4,588,968

LOW NOISE CONSTANT AMPLITUDE OSCILLATOR CIRCUIT

Donald T. Wile, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Feb. 16, 1984, Ser. No. 580,592
Int. Cl.⁴ H03L *5/00*
U.S. Cl. 331—109 **4 Claims**



1. An oscillator circuit comprising:

a tank circuit;

variable gain amplifier means comprising a constant G_M differential amplifier driven from a variable gain differential control amplifier, said variable gain amplifier means having an output coupled to drive said tank circuit, a gain control input, and a signal input;

means for coupling said tank circuit to said signal input whereby said tank circuit is caused to oscillate;

level detector means, including a peak rectifier responsive to the peak level of the signal on said tank circuit, coupled to sense said tank circuit oscillation and having an output coupled to said gain control input; and

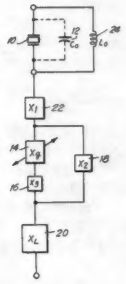
means for providing a threshold level for the peak rectifier whereby said threshold level determines the amplitude of the oscillator signal and said tank circuit oscillates at constant amplitude.

4,588,969

ADJUSTABLE CRYSTAL OSCILLATOR WITH ACCELERATION COMPENSATION

Donald A. Emmons, Carlisle, Mass., assignor to Frequency and Time Systems, Inc., Beverly, Mass.

Filed Aug. 17, 1984, Ser. No. 641,696
Int. Cl.⁴ H03B *5/32*
U.S. Cl. 331—158 **13 Claims**



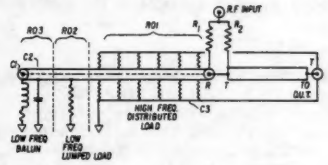
1. A variable oscillator adjustable by a user to a desired frequency comprising apparatus for compensating for the variation of crystal resonator frequency under conditions of acceleration, said apparatus comprising a variable reactance element inserted in series with said crystal resonator, said variable reactance element comprising a compensator having characteristics which are dependent upon the conditions of acceleration, said characteristics of said compensator being substantially complementary to the characteristics of said crystal resonator to balance out said variations of said crystal resonator during conditions of acceleration, a variable reactance network connected to said oscillator to adjust the operating frequency of said oscillator, said variable reactance further comprising an inductive element.

4,588,970

THREE SECTION TERMINATION FOR AN R.F. TRIAXIAL DIRECTIONAL BRIDGE

S. Bruce Donecker, Sebastopol, and Julius K. Botka, Santa Rosa, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 9, 1984, Ser. No. 568,986
Int. Cl.⁴ H01P *1/26*
U.S. Cl. 333—22 R **13 Claims**



1. A wide bandwidth R.F load having a substantially constant impedance over a range of frequencies comprising:

an input port;

a first and second conductor coupled to said input port;

a first distributed load which is distributed along and between said first and second conductors, said distributed load having an inner taper and an outer taper with said inner taper comprising a first material having a first inner dielectric constant and a first inner attenuation coefficient and said outer taper comprising a second material having

first outer dielectric constant and a first outer attenuation coefficient, with said first inner dielectric constant being smaller in magnitude than the magnitude of said first outer dielectric constant and said first inner attenuation coefficient being smaller in magnitude than the magnitude of said first outer attenuation coefficient;

a lumped load coupled to said distributed load opposite said input port; and

a second distributed load coupled to said lumped load opposite said distributed load relative to said lumped load, constructed of a lossy material having a magnetic permeability which is substantially larger than the magnetic permeability of both said first material and said second material.

4,588,971

ELECTRIC TRANSFORMER WITH ANNULAR COIL FORMS

Jean-Claude Beisser, La Chaux de Fonds, Switzerland, assignor to Societe Nouvelle Transfix, Cahors, France

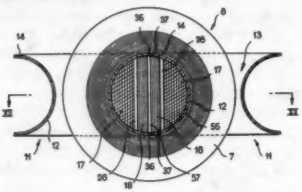
PCT No. PCT/FR82/00209, § 371 Date Aug. 9, 1983, § 102(e) Date Aug. 9, 1983, PCT Pub. No. WO83/02194, PCT Pub. Date Jun. 23, 1983

PCT Filed Dec. 10, 1982, Ser. No. 527,650

Claims priority, application France, Dec. 11, 1981, 81 23146

Int. Cl.⁴ H01F *33/00, 27/30*

U.S. Cl. 336—5 **14 Claims**



1. An electric transformer comprising at least two electrically insulating annular forms (11) having each a substantially half-circular profile opening radially outwardly, at least one electric circuit (9) contained in the half circular profile of each form (11), and at least one magnetic circuit (8) comprising at least one strip of magnetic material wound so as to form a ring having a circular window in a central portion thereof, said forms surrounding two sections of said ring which are opposite to each other relative to said window, while the ring surrounds the forms in a region where they are assembled to each other at two diametrically opposed positions of a circle formed by their half-circuit profiles together so as to substantially enclose said electric circuits with respect to the ring in said region.

4,588,972

ELECTROMAGNETIC INDUCTION APPARATUS WITH COOLING GROOVES

Yoshinobu Harumoto, 6-5-13, Tokiwa-dai, Toyono-cho, Toyono County, Osaka; Yoshio Yoshida, 8, Sakuraga-oka 3-chome, City of Minoo, Osaka; Yuichi Kabayama, 18-5, Fujigao 6-chome, City of Katano, Osaka; Hisao Kan, Ako; Tetsuro Hakata, Ako, and Takahiro Matsumoto, Ako, all of Japan, assignors to Yoshinobu Harumoto; Yoshio Yoshida; Yuichi Kabayama and Mitsubishi Denki Kabushiki Kaisha, all of Tokyo, Japan

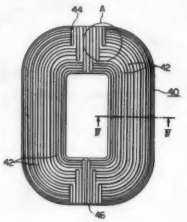
Filed Dec. 13, 1984, Ser. No. 681,193

Claims priority, application Japan, Dec. 23, 1983, 58-243386

Int. Cl.⁴ H01F *27/10*

U.S. Cl. 336—58 **4 Claims**

1. An electromagnetic induction apparatus cooled with a liquid refrigerant sprinkled thereon which apparatus comprises an iron core, a vertically disposed winding assembly magnetically coupled to said iron core and including a plurality of serially adjacent pancake coils each formed in a vertical plane of a rectangular electrically conductive wire wound around said iron core, and a plurality of electrically insulating bases interposed between adjacent ones of said plurality of pancake coils, each of said electrically insulating bases being provided on a surface thereof contacted by an associated one of said pancake coils with a plurality of cooling grooves extending from an upper central portion of said pancake coils to a lower central portion of said pancake coils along vertical side portions and upper and lower curved portions of said turns of said wire in parallel, spaced relationship along and in contact with turns of said electrically conductive wire so as not to cross over said turns and so as to define lands between said cooling grooves contacting said pancake coils, each of said plurality of cooling grooves being narrower than the width of said wire and having one end opening on an upper central portion of said electrically insulating base and an opposite end opening on a lower central portion thereof so that said open ends of said



plurality of cooling grooves on each of said upper and lower central portions of said electrically insulating base are symmetrically located on opposite sides of a vertically extending longitudinal central axis of said base, and a refrigerant sprinkler disposed above said winding assembly and said iron core to sprinkle said liquid refrigerant on both said winding assembly and said iron core to flow in said plurality of cooling grooves, wherein each of said electrically insulating bases is further provided on the surface of the upper and lower central portions thereof, including said open ends of said cooling groove, with a plurality of inflow and exit grooves disposed in spaced relationship and in parallel to said longitudinal axis on each side of the longitudinal axis symmetrically with respect to said longitudinal axis, said plurality of inflow and exit grooves providing adjacent ones of said open ends of said cooling grooves with communication with an outer periphery of said pancake coil.

4,588,973

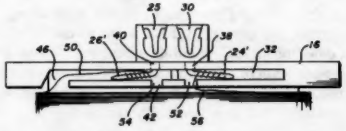
COIL BOBBIN HAVING NOVEL MEANS FOR TERMINATING FINE WIRES

Neil E. Grah, Fairland, and Albert C. Bannon, Indianapolis, both of Ind., assignors to Emhart Industries, Inc., Indianapolis, Ind.

Continuation of Ser. No. 527,242, Aug. 29, 1983, abandoned, which is a continuation of Ser. No. 288,672, Jul. 30, 1981, abandoned. This application Nov. 1, 1985, Ser. No. 794,262

Int. Cl.⁴ H01F *15/10*

U.S. Cl. 336—192 **3 Claims**



1. A coil bobbin, comprising a cylinder having an outer surface upon which wire may be wound; oppositely disposed

flanges extending outwardly from opposed ends of said cylinder providing an annulus for receiving said wire; a housing carried on one of said flanges; a slit disposed within said one flange extending along a perimeter thereof beneath and at least to opposed sides of said housing; a pair of apertures in a base of said housing extending through said one flange to said slit; a pair of exits from said slit to said annulus, one at an end of said slit, the other beneath said housing in line with said pair of apertures; and a partition extending within and across a width of said slit between said pair of apertures and into said exit beneath said housing.

4,588,974

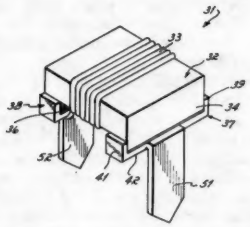
COIL ASSEMBLY HAVING CLAMPED AND BONDED CONTACTS

John Hill, Cincinnati, Ohio, assignor to Standex International Corporation, Salem, N.H.

Filed Aug. 15, 1984, Ser. No. 640,945

Int. Cl.[4] H01F *15/10, 27/30*

U.S. Cl. 336—192 **9 Claims**



1. A coil assembly comprising:

a core;

an inductive winding on the core;

an electrically conductive contact element on the core, formed to have a web and at least two generally opposed portions applying a clamping force to the core, electrically connected to a first location on the winding; and

a resin adhesive means on and between the web and core bonding the contact element to the core, said clamping force serving to hold the contact element in place on the core during bonding.

4,588,975

INTEGRATED SENSOR FOR FORCE AND MOTION

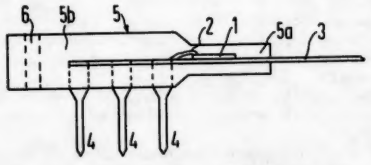
Herbert F. Roloff, and Hartwig W. Köllner, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 30, 1983, Ser. No. 510,082

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1982, 3224792

Int. Cl.[4] G01L *1/22, 1/18*

U.S. Cl. 338—5 **7 Claims**



1. Integrated sensor for force and motion, comprising a solid insulating material body, a flexible metal strip formed of an iron-copper alloy for force transmission sealed to and extending out of said body, a piezoresistive probe in the form of a silicon wafer fastened on said metal strip in said body for mechanical loading by said metal strip, conductive connections sealed to and extending out of said body for application to an electrical instrument and for voltage supply to said probe, and at least two electrical terminals connected between said silicon wafer and said conductive connections.

4,588,976

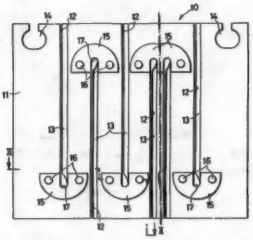
RESISTORS OBTAINED FROM SHEET MATERIAL

Franco Jaselli, Milan, Italy, assignor to Microelettrica Scientifica S.P.S., Milan, Italy

Filed Nov. 19, 1984, Ser. No. 673,168

Int. Cl.[4] H01C *3/10*

U.S. Cl. 338—284 **3 Claims**



1. An improved electrical grid resistor of the type comprising a thin, flat, metal sheet having a pair of spaced side edges, a first plurality of spaced slots in said sheet opening at one end on one of said side edges and extending from said one side edge transversely of said sheet and part way only toward the opposite side edge thereof, a second plurality of spaced slots formed in said sheet in spaced, alternating relation with said first plurality, each of said second plurality of slots opening at one end on said opposite side edge of said sheet and extending from said opposite side edge transversely of said sheet between an adjacent pair of said first plurality of slots, and part way only toward said one side edge of said sheet, and characterized by the fact that at least one each of a first plurality of spaced, electrically conductive plates is fastened in electrical contact with at least one surface of said sheet at the inner, closed end of each of said slots, each of said one plates overlying said one surface of said sheet only in the areas at the inner end of the associated slot and adjacent side portions thereof, each of said plates being generally semi-circular in configuration and having in the diametral side thereof a notch which is similar in configuration to, and which registers with, the inner end of the associated slot in said sheet, whereby the plate conforms to the configurtion of that portion of the sheet which is immediately adjacent to the inner end of the associated slot, including the areas at the sides of the slot.

4,588,977

APPARATUS FOR DETECTING DEFLATION OF A GUIDE WHEEL TIRE OF A TRANSPORTATION VEHICLE

Daniel Ferbeck, Issy-les-Moulineaux, and Jamuel Mimoun, Plaisir, both of France, assignors to MATRA, Paris, France

Filed Oct. 29, 1982, Ser. No. 437,554

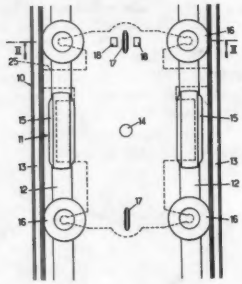
Claims priority, application France, Nov. 4, 1981, 81 20698

Int. Cl.[4] B60C *23/00*

U.S. Cl. 340—58 **10 Claims**

1. In a mass transportation system comprising a roadway having parallel supporting tracks and stationary guide means parallel to said tacks and at least a vehicle provided with a support structure having support wheels for rolling movement on said tracks and having guide wheels provided with inflated tires which are in rolling contact with said guide means and are symmetrically located with respect to said guide means, an

apparatus for detecting deflation of any one of said tires including sensor means for detecting lateral offset of the support structure with respect to the tracks from a set position and



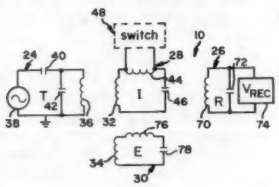
signal delivering means connected to said sensor means to provide an alarm signal when the amount of offset exceeds a predetermined value.

4,588,978

REMOTE SWITCH-SENSING SYSTEM

Henry V. Allen, Fremont, Calif., assignor to Transensory Devices, Inc., Fremont, Calif.

Filed Jun. 21, 1984, Ser. No. 622,784
Int. Cl.[4] B60C *23/00*
U.S. Cl. 340—58 **22 Claims**



1. A system for monitoring an open/closed condition switch carried on one of a pair of remote members, said system comprising

a transmitter mounted on the other remote member, including a transmitter coil which is positioned adjacent the one remote member, and means for coupling an alternating current to said coil, such that a selected-frequency electromagnetic field is generated thereby,

an inductor circuit carried on the one remote member, including an inductor coil operatively positioned adjacent the transmitter coil during operation of the system, and a switch element including such open/closed condition switch and circuit components operatively connecting the switch to the inductor-circuit coil to vary, according to the condition of the switch, the characteristics of a signal induced in the circuit by magnetic coupling between the transmitter and circuit coils, when the transmitter is generating such selected-frequency field,

a receiver mounted on the other remote member, including a coil positioned for magnetic coupling to the inductor-circuit coil during operation of the system, and a monitoring circuit for detecting the signal response voltage in the inductor circuit according to a signal produced in the receiver coil by inductive coupling with the inductor circuit coil, and

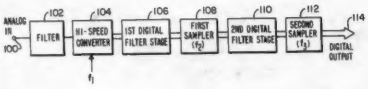
an enhancer circuit carried on the one remote member, including an inductor coil magnetically coupled to the inductor-circuit coil, and circuit means for producing resonance characteristics in the enhancer circuit which act to increase the signal voltage produced in the receiver circuit coil at a selected signal frequency, over that producible in the receiver circuit coil in the absence of the enhancer circuit.

4,588,979

ANALOG-TO-DIGITAL CONVERTER

Robert W. Adams, Acton, Mass., assignor to DBX, Inc., Newton, Mass.

Filed Oct. 5, 1984, Ser. No. 658,399
Int. Cl.[4] H03K *13/02*
U.S. Cl. 340—347 AD **21 Claims**



1. A device for converting an analog input signal to a relatively high resolution digital output signal representative of said analog input signal within a predetermined bandwidth, said device comprising:

means for converting said analog input signal to a first relatively low resolution digital, signal at a first word repetition rate, said first digital signal being representative of said analog signal;

signal generating means for generating said digital output signal at an output word repetition rate in response to and as a function of said first digital signal, said output word repetition rate being less than said first word repetition rate, said signal generating means comprising (1) means for generating an intermediate digital signal at an intermediate word repetition rate in response to and as a function of said first digital signal, said intermediate word repetion rate being less than said first word repetion rate and greater than said output word repetition rate, (2) means for minimizing aliasing resulting from the differences in said word repetition rates and (3) means for attenuating those portions of said intermediate digital signal representative of out-of-band signals and noise of said analog input signal outside said bandwidth.

4,588,980

RESIDUE TO ANALOG CONVERTER

Peter S. Bernardson, Tempe, Ariz., assignor to GTE Communication Systems Corporation, Phoenix, Ariz.

Filed Sep. 24, 1984, Ser. No. 653,423
Int. Cl.[4] H03M *1/12*
U.S. Cl. 340—347 DA **27 Claims**

1. Apparatu's, which does not require any memory devices, for converting a binary representation of a residue signal {m1,m2,m3} in a prescribed residue number system that is defined by the moduli set $\{p=2^n-1,\ p2=2^n,\ p3=2^n+1\}$, where n is an integer, to an associated binary output signal r(m1,m2,m3), said apparatus comprising:

first means responsive to the residue digit signals m1 and m3 for producing first and second digital output signals which are binary representations of the sum and difference of m1 and m3;

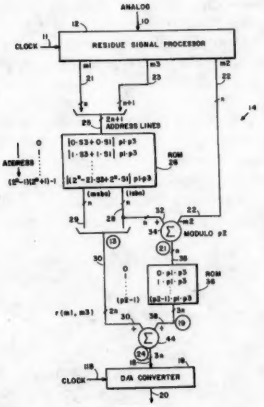
second means for producing a third binary signal corresponding to the product of the first signal and the constant $(2^{2n}-1)$;

third means for producing a fourth output signal corresponding to the product of the second signal and the constant (2^{n-1});

fourth means summing said third and fourth signals modulo p1*p3 for producing a fifth output signal on a plurality of output lines which is a binary representation of the modulo p1*p3 sum of products of the residue digit signals m1

and m3 and associated constants S3 and S1, where S1=p1*p2/2 and S3=p2*p3/2;

fifth means responsive to bits of the fifth output signal of said fourth means and the residue digit signal m2 for producing a sixth output signal which is the modulo p2 difference therebetween;



sixth means producing a seventh output signal which is the product of the sixth output signal of said fifth means and the constants p1 and p3; and

seventh means responsive to the fifth and seventh output signals from said fourth and sixth means for producing the binary output signal r(m1,m2,m3) which is the sum thereof and which corresponds to the residue signal {m1,m2,m3}.

4,588,981

DOUBLE INTEGRATION, DELTA-SIGMA, ANALOG-DIGITAL CODER

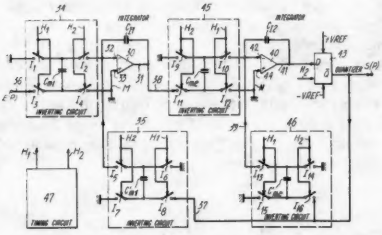
Patrice Senn, 13 Grande rue, 38000 Grenoble, France

Filed Sep. 20, 1983, Ser. No. 534,096

Claims priority, application France, Sep. 21, 1982, 82 15857

Int. Cl.⁴ H04B *14/06*

U.S. Cl. 340—347 AD **6 Claims**



1. A double integration, delta-sigma coder, incorporating a first adder receiving on a first input a signal to be encoded and receiving the coded signal on a second input, a first integrator receiving on one input an output signal from the first adder, a second adder receiving on a first input the signal from one output of the first integrator, a second input of said second adder receiving a signal having a mean amplitude proportional to the amplitude of the coded signal, a second integrator receiving on an input the output signal of the second adder, a quantizer circuit, one input of which is connected to an output of the second integrator and a control input of which receives a sampling signal of the signal to be coded, an output of said quantizer circuit supplying the coded signal, wherein the first adder and the first integrator comprise a first operational amplifier, an output of which is connected to a negative input of said first operational amplifier by a first integration capacitor, a positive input of said first operational amplifier being connected to a reference earth, and a first pair of inverting circuits with switched capacitors connected in parallel on the inputs of said first operational amplifier and respectively receiving on their inputs the signal to be encoded and the coded signal, the second adder and the second integrator comprising a second operational amplifier, an output of which is connected, on the one hand, to a negative input of said second operational amplifier by a second integration capacitor and, on the other hand, to the input of the quantizer circuit, a positive input of said second operational amplifier being connected to reference earth and a second pair of inverting circuits with switched capacitors connected in parallel on the inputs of said second operational amplifier and respectively receiving on their inputs the output signal of said first operational amplifier and the coded signal.

4,588,982

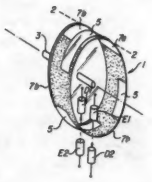
OPTICAL SHAFT ENCODER

R. Wendell Goodwin, Dunwoody, Ga., assignor to Sangamo Weston, Inc., Norcross, Ga.

Filed Sep. 13, 1984, Ser. No. 650,031

Int. Cl.⁴ H03M *1/26*

U.S. Cl. 340—347 P **13 Claims**



1. An optical encoder, comprising:

a rotatable optical shutter bearing at least light transmissive and light reflective areas thereon;

at least a first light emitter and a first light detector arranged adjacent one another on one side of the optical shutter;

at least a second light emitter and a second light detector arranged adjacent one another on a second side of the optical shutter and opposite the first light emitter and first light detector; and

means for alternately energizing the first and second light emitters to illuminate the light transmissive and light reflective areas of the optical shutter and for detecting the illuminated or unilluminated status of the first and second light emitters and the outputs of the first and second light detectors in response to such illumination, whereby the outputs of the first and second light detectors, when taken together with the illuminated or unilluminated status of the first and second light emitters, are indicative of the position of the optical shutter relative to the first and second light emitters and detectors.

4,588,983

INSTANTANEOUS GAIN CHANGING ANALOG TO DIGITAL CONVERTER

Norman H. Strong, Seattle, Wash., assignor to John Fluke Mfg. Co., Inc., Everett, Wash.

Continuation of Ser. No. 443,673, Nov. 22, 1982. This application Jun. 17, 1985, Ser. No. 744,909

Int. Cl.⁴ H03K *13/02*

U.S. Cl. 340—347 NT **5 Claims**

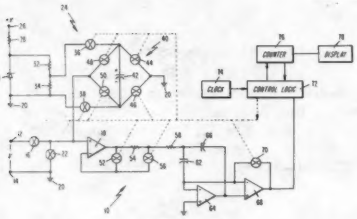
1. In an integrating analog to digital converter of a type comprising an input for receiving an analog input signal; refer-

ence signal means for generating a reference signal; clock means for generating a clock signal; integrator means for integrating selectively said input signal and said reference signal; comparator means responsive to said integrator means and to a base signal for generating a comparator signal; an output for providing a digital signal corresponding to said input signal; and controller means for applying said input signal to said integrator means for integration in a first direction for a predetermined time, applying the reference signal to said integrator means for integration in an opposite direction to a base level, counting said clock signal generated during said integration in said opposite direction to provide a count and applying said count to said output; an improvement comprising:

range means in circuit between said input and said integrator means, said range means including:

first and second attenuator means;

means for amplifying a signal applied to said range means selectively with first and second gains, and amplifying means tending to have an offset;



wherein said amplifying means comprises an amplifier having an inverting input and an output, and means for (1) connecting said output along a first path to said inverting input to establish said first gain and (2) connecting said output through a second path including said first attenuator means to said inverting input to establish said second gain;

zeroing means coupled to said input and said integrator means during an auto-zero mode for cancelling any offset of said amplifying means, whereby substantially no current flows through said first and second attenuator means; and

logic means for controlling said range means to amplify said input analog signal with said first and second gains, selectively, as a function of the expected analog input signal amplitude range;

said offset thereby being independent of the gain of said amplifying means.

4,588,984

CLOCKED PRECISION INTEGRATING ANALOG-TO-DIGITAL CONVERTER SYSTEM

Adrian K. Dorsman, Sheldon, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 12, 1983, Ser. No. 560,773

Int. Cl.[4] H03K *13/20*

U.S. Cl. 340—347 NT **19 Claims**

1. An analog-to-digital conversion system comprising:

a voltage source means referenced to a reference potential, such as ground, for providing at least one precision voltage reference, and

at least one analog-to-digital conversion channel, each respective analog-to-digital conversion channel having:

a floating first means for generating a precision unipolar current, each respective floating first means being responsive to said precision voltage reference and having:

a scaling resistor, having a predetermined resistance value, and a first and second terminal;

a current source terminal, and

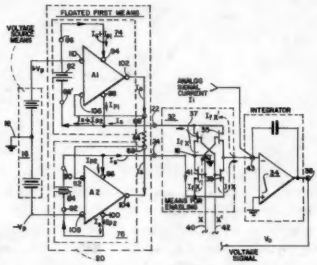
a current sink terminal;

said floating first means being characterized as sourcing said precision unipolar current to said current source terminal at a first potential and sinking said precision unipolar current from said current sink terminal at a second potential;

a summing terminal for receiving an analog signal current;

means for enabling the precision unipolar current to flow by way of a first direction through said enabling means to said current sink terminal from a reference potential, through said floating first means to said current source terminal, from said current source terminal to said summing terminal during a first mode of operation and to flow by way of a second direction through said enabling means from said summing terminal to the current sink terminal, through said floating first means to said current source terminal, from said current source terminal to the reference potential during a second mode of operation;

said floating first means being further characterized to apply a voltage essentially equivalent to said voltage reference between said scaling resistor first and second terminals to



control the value of said precision unipolar current from said current source terminal through said means for enabling to said current sink terminal, said precision unipolar current value being relatively independent of said current source terminal first potential and said current sink terminal second potential, said precision unipolar current value being relatively equal to the value of said precision voltage reference divided by said scaling resistor predetermined resistance value;

an integrator coupled to the summing terminal for generating a voltage signal proportional to the integral of the sum of the precision unipolar current and analog signal current flowing through said summing terminal;

a timing source for providing timing signals, and

second means, coupled to said enabling means, said second means being responsive to said timing signals from said timing source and to the voltage signal for controlling the first and second modes of operation of said means for enabling; and, for generating a digital represenation of the amplitude of the analog signal current.

4,588,985

POLYNOMIAL HASHING

John L. Carter, Putnam Valley, and Mark N. Wegman, New York, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1983, Ser. No. 567,199

Int. Cl.[4] H03M *7/00*

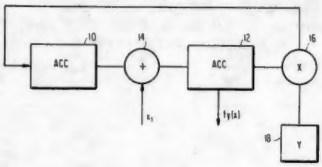
U.S. Cl. 340—347 DD **23 Claims**

1. A method of compressing an input data word x into a first output data word form a set of b possible output data words, b being of the form p^k where p is a prime number and k is a positive integer, said method comprising the steps of:

separating said input data word x into n portions x_1 through x_n;

selecting an element y from a finite field of b elements; and

generating said first output data word according to $fy(x-)=y^0x_1+y^1x_2+\ldots+y^{n-1}x_n$, where the addition and



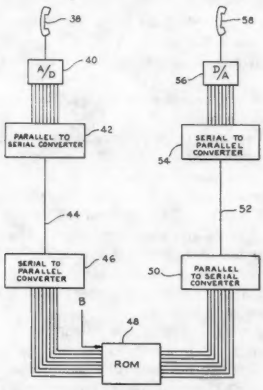
multiplication operations are those of said finite field of b elements.

4,588,986

METHOD AND APPARATUS FOR OPERATING ON COMPANDED PCM VOICE DATA

Frank Byrne, Cocoa Beach, Fla., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 28, 1984, Ser. No. 655,601
Int. Cl.[4] H03M *1/12*
U.S. Cl. 340—347 DD **8 Claims**



1. A method of digitizing audio signals being generated from a plurality of parties in order to provide audio communication between the parties with a minimum of interference comprising:

converting said audio signals produced by said parties from an analog signal to parallel digital signals;

converting said parallel digital signals to first serial PCM companded wave trains;

transmitting each of said first serial PCM companded wave trains over a single wire to a remote location;

converting each of said first serial PCM companded wave trains back to second parallel digital signals;

feeding each said second parallel digital signals to a preprogrammed ROM producing on its output terminals a third eight-bit companded parallel signal;

feeding each said third eight-bit companded parallel signal to a parallel-to-serial converter for being converted to a second serial PCM signal;

transmitting said second serial PCM signal over a line to another serial-to-parallel converter and digital-to-analog converter producing a reproduced analog signal; and

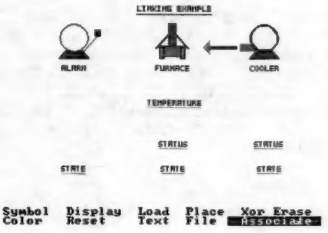
feeding said reproduced analog signal to a receiver which reproduces an audio signal from said reproduces analog signal.

4,588,987

DISPLAY SYSTEM FOR MONITORING AND ALARM SYSTEM

Lawrence K. Stephens, Dallas, Tex., assignor to International Business Machines Corp., Armonk, N.Y.

Filed Sep. 13, 1983, Ser. No. 531,774
Int. Cl.[4] G08B *25/00*
U.S. Cl. 340—525 **10 Claims**



5. A method of providing a display for a monitoring and alarm system comprising the steps of

interactively generating on a computer screen a schematic display of the system or environment being monitored,

dynamically linking alarm areas on the schematic display with a group or single variable defined by the user,

dynamically linking message areas on the schematic display with user defined messages to be displayed in the event all the conditions defined by the states and limits of variables in a group are true, and

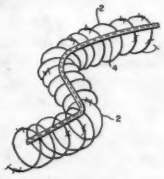
storing in computer memory each schematic display generated together with the data defining the linked areas of the display.

4,588,988

INTRUSION BARRIER AND DETECTION APPARATUS

Nicholas V. Karas, Lowell, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 6, 1984, Ser. No. 617,667
Int. Cl.[4] G08B *13/18*; G01S *13/00*
U.S. Cl. 340—552 **5 Claims**



1. An intrusion barrier and detector comprising:

a coil of wire;

a ported coaxial cable disposed on the external surface of said coil of wire and extending along the length thereof;

and a radio frequency signal transceiver system coupled to said ported coaxial cable;

said radio freuency transceiver system being adapted to transmit radio frequency energy to said ported coaxial cable and to receive radio frequency signals from said ported coaxial cable indicative of intruder detection;

said coil of wire having an interturn spacing not exceeding

0.1λ, where λ is the wavelength of said radio frequency energy;

said coil of wire providing a tubular-shaped metallic grounding surface which alters the electromagnetic field of said radio frequency energy radiated by said ported coaxial cable to direct and concentrate said energy about said coil of wire.

4,588,989

SUPERVISORY DEVICE FOR WRONG OPERATION OF VARYING QUANTITY MEASURING APPARATUS

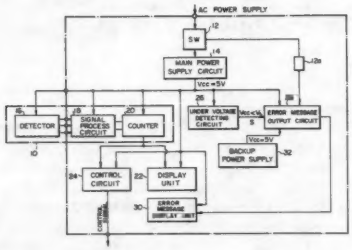
Mamoru Yasuda, and Takeshi Nishimura, both of Kawasaki, Japan, assignors to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan

Filed Feb. 15, 1984, Ser. No. 580,459

Claims priority, application Japan, Feb. 22, 1983, 58-28168

Int. Cl.⁴ G08B *21/00*

U.S. Cl. 340—663 **1 Claim**



1. A displacement measuring apparatus comprising a main power supply which outputs a predetermined DC stabilized voltage in response to the turning on of a power switch, an encoder which is energized by an output voltage from the main supply circuit to convert the relative displacement of a main scale and an index scale into electric pulse signal being supplied to a counter, a display unit for displaying the digitally counted value of the counter, and an error warning device for warning of an error in display of the counter, wherein the error warning device comprises:

a voltage drop detecting circuit for supplying a voltage detecting signal when the output voltage from the main power supply circuit drops under a reference voltage which is predetermined as a necessary voltage for required error free operation of the encoder;

an error message output circuit for outputting an error message when the voltage drop detecting signal is generated when the power switch of the main power supply circuit is turned on;

an error message display unit for displaying the error message supplied from the error message output circuit;

a back-up power supply means independently provided from the main power supply circuit for supplying back-up DC stabilized voltage to the error message output circuit;

an auxiliary switch connected between the main power switch and the error message output circuit for clearing an error message register in the error message output circuit to stop the outputting of said error message;

wherein the occurrence of main power output voltage under the reference voltage produces an error message upon the error message display unit and the error message is not cleared with the main power voltage drop due to the back-up power supply, but cleared by either turning off the power switch or the auxiliary switch.

4,588,990

IMAGE DISPLAY APPARATUS

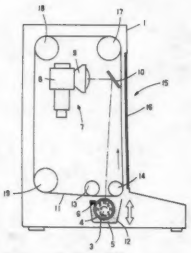
Yasuyuki Tamura, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 30, 1983, Ser. No. 509,866

Claims priority, application Japan, Jul. 7, 1982, 57-118097

Int. Cl.⁴ G09G *3/26;* G01D *15/14*

U.S. Cl. 340—792 **6 Claims**



1. An image display apparatus for observing visible discrete images formed on an image bearing web, said apparatus comprising:

a display section for allowing observation of an image which has been formed on an image bearing web in the form of a belt movable within a casing, said image bearing web having such a length that two or more images can be formed thereon for observing one of them in said display section;

a plurality of support members for movably supporting said image bearing web;

drive means for moving said image bearing web along said support members;

image formation means for forming a visible image on said image bearing web, said image formation means being movable between a first position wherein it is relatively far from the web and a second position wherein it is relatively near the web for image formation;

means for instructing to reintroduce into said display section the image on said image bearing web after it has passed by said display section; and

control means responsive to said instructing means for moving and stopping the web to reintroduce the once displayed image that has passed by said display section back into said display section and for moving said image formation means from said second position to said first position and maintaining said image formation means in said first position when the once displayed image is reintroduced into said display section.

4,588,991

FILE ACCESS SECURITY METHOD AND MEANS

Martin M. Atalla, Atherton, Calif., assignor to Atalla Corporation, San Jose, Calif.

Filed Mar. 7, 1983, Ser. No. 472,609

Int. Cl.⁴ H04Q *9/00;* H04L *9/00*

U.S. Cl. 340—825.31 **13 Claims**

1. Method of securing data files in storage against unauthorized access, comprising the steps of:

encrypting file data as a selected logical combination thereof with an initial one of a plurality of encryption key codes to produce file data in encrypted form for storage at selected file address locations;

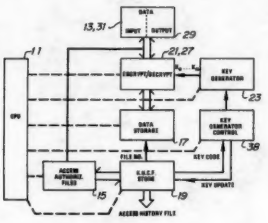
establishing a record of accesses to each selected file address location and the one of the plurality of encryption key codes with which the file data at the address location is encrypted;

processing a request for access to file data at a selected file address location by determining from the record the number

of prior accesses thereof and the encryption key code associated therewith;

decrypting file data at the selected file address location using said associated encryption key code;

re-encrypting file data for said selected file address location using a new one of said plurality of encryption key codes in said selected logical combination;



storing the newly re-encrypted file data at the accessed file address location; and

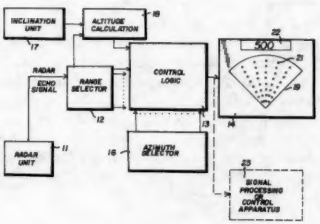
modifying the record to indicate an additional access to the selected file address location and the new encryption key code associated therewith.

4,588,992

RADAR TRACKING SYSTEM AND DISPLAY

William E. Clark, 2035 Chisholm Trail, Las Cruces, N. Mex. 88005

Filed Nov. 1, 1982, Ser. No. 438,244
Int. Cl.[4] G01S *7/26*
U.S. Cl. 343—10 **6 Claims**



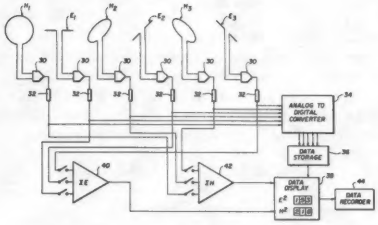
1. Apparatus for use in conjunction with a hand-held radar unit of the type producing a radar echo signal indicating the presence of a target when manually scanned, which radar signal varies in accordance with the range of the target, comprising azimuth determination means mounted to the radar unit for providing an azimuth signal indicative of the aximuth orientation of the radar unit as the radar unit is manually scanned, a display means comprising a two-dimensional array of selectively energizable elements disposed along two axes of said array and having two visually distinctives states, one of said axes representing azimuth and the other representing range; said radar signal and said azimuth signal coupled to said display means, means for energizing selected of said selectively energizable elements as an indication of the presence of a target during manual scanning of said radar unit, with the selected elements being selected along one axis in accordance with range information in the radar signal and along another axis in accordance with said azimuth signal, and wherein said azimuth determination means comprises a ball type compass having a compass rose opaque except for one small light-transmitting window; a source of light within the interior of said compass rose; a plurality of light-sensing means positioned adjacent the periphery of said compass rose, such that a selected one of said light-sensing means illuminated by light through said one small light-transmitting window, and means for generating an azimuth signal indicating which of said light-sensing means is illuminated as an indication of the azimuth orientation of said radar unit.

4,588,993

BROADBAND ISOTROPIC PROBE SYSTEM FOR SIMULTANEOUS MEASUREMENT OF COMPLEX E- AND H-FIELDS

Tadeusz M. Babij, Ft. Lauderdale, Fla., and Howard Bassen, N. Chevy Chase, Md., assignors to The United States of America as represented by the Secretary of the Department of Health and Human Services, Washington, D.C.

Continuation-in-part of Ser. No. 210,584, Nov. 26, 1980, abandoned. This application May 19, 1983, Ser. No. 496,275
Int. Cl.[4] G01S *3/02*; G01R *31/02*
U.S. Cl. 343—351 **22 Claims**



1. An isotropic, broad band, non-directional, rf electromagnetic radiation probe, comprising:

an isotropic set of E-field antennas;

an isotropic set of H-field antennas essentially encompassing the same volume of space as the set of E-field antennas; and

circuit means for simultaneously meauring and displaying the sum of any of the squared vector components of both the E-field and the H-field radiation detected by said probe, said circuit means comprising switching means square law detector means associated with each antenna in each of said sets of antennas, summing means, means for feeding the outputs of said square law detectors to said summing means, display means, and means for feeding the output of said summing means to said display means.

4,588,994

CONTINUOUS FERRITE APERTURE FOR ELECTRONIC SCANNING ANTENNAS

Raymond Tang, Fullerton, and Joseph M. Hellums, Torrance, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Oct. 18, 1982, Ser. No. 440,391
Int. Cl.[4] H01Q *11/06*
U.S. Cl. 343—754 **10 Claims**

1. An electronically scanned continuous aperture antenna comprising:

a ferrite block having a front surface and a parallel back surface, each such surface having a height substantially equal to its width, said block comprising a first half block and a second half block separated by a layer of non-magnetic dielectric material oriented with its major surfaces parallel to the direction of propagation of electromagnetic energy so as to reduce transverse magnetization of said ferrite block;

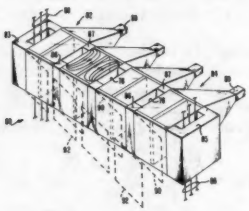
means coupled to the back surface for illuminating said back surface with electromagnetic energy waves;

said front and back surfaces having dimensions substantially greater than one half the wavelength of said energy waves;

means for establishing a magnetization within said ferrite

block, the strength of said magnetization having a substantially linear taper across the ferrite block in a plane orthogonal to the direction of propagation of said electromagnetic energy waves; and

means for adjusting the slope of said taper;



whereby electromagnetic energy waves emerging from the front surface of said block are phase shifted with respect to the electromagnetic energy waves entering said back surface by an amount which varies in the same manner as said magnetization, and said continuous aperture may be scanned by adjusting the slope of said taper.

4,588,995

MAGNETIC RECORDING MEDIUM

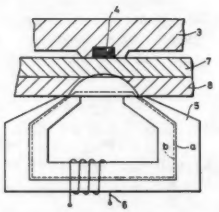
Nobuo Nishimura; Teruhiko Itami; Toshifumi Kimoto, and Koichi Saitoh, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Japan

Division of Ser. No. 376,993, May 11, 1982, Pat. No. 4,480,258. This application Jun. 5, 1984, Ser. No. 617,404

Claims priority, application Japan, Jul. 19, 1981, 56-106968

Int. Cl.[4] G01D *15/12*

U.S. Cl. 346—74.2 **9 Claims**



1. A method of forming a magnetic latent image, comprising:

providing a recording medium having at least a high permeability layer possessing a low Curie temperature, and a magnetic recording layer;

disposing a heat generating element in close contact with said recording layer;

applying heating pulses modulated with image data to said element;

disposing a magnetic recording head on a side of said recording medium opposite said element; and

selectively heating said high permeability layer at least up to said Curie point according to said image data, to thereby temporarily render said high permeability layer non magnetic, whereby a magnetic recording signal from said head may be applied through said high permeability layer to said recording layer.

4,588,996

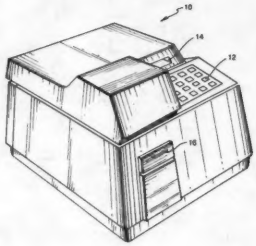
THERMAL RIBBON CARTRIDGE TRANSPORT IN A POSTAGE METER THERMAL PRINTER

William A. Ross, Darien, and Kenneth A. Terry, Fairfield, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Jun. 19, 1984, Ser. No. 622,035

Int. Cl.[4] G01D *15/10;* **B41J** *15/00;* **G06F** *1/106*

U.S. Cl. 346—76 PH **1 Claim**



1. In an electronic postage meter of the type including accounting means and means for inputting postal data, the improvement comprising thermal printing means for printing postal value along with other indicia, said printing means including:

(a) a thermal print head which includes a plurality of thermal heating elements operative to receive voltage pulses for heating thereof to a predetermined temperature;

(b) a tape drive means for moving an impression receiving tape past the individual elements of the print head during a print cycle;

(c) a thermal transfer ribbon transportation means, said transportation means including a removable cassette including a housing for holding spools of thermal transfer ribbon, means for driving one of said spools for taking up said transfer ribbon, said tape drive means including movable drive rollers, said drive rollers being positioned at a first position during the print cycle for driving said tape and at the end of each said print cycle said drive rollers being moved into a position wherein said transfer ribbon may be easily threaded into position adjacent to the thermal head.

4,588,997

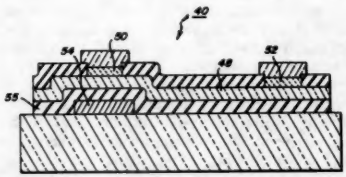
ELECTROGRAPHIC WRITING HEAD

Hsing C. Tuan, and Malcolm J. Thompson, both of Palo Alto, Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 4, 1984, Ser. No. 678,146

Int. Cl.[4] G01D *15/10;* **H05B** *1/02*

U.S. Cl. 346—76 PH **13 Claims**



1. An improved thin film electrographic marking head characterized by comprising

a substrate,

a plurality of marking electrodes upon said substrate,

a plurality of high voltage transistors upon said substrate,

each high voltage transistor connected to a marking electrode, each high voltage transistor including a source electrode, a drain electrode and a gate electrode, and each of said high voltage transistors being capable of switching a marking potential of several hundred volts between said source and said drain by means of a gate potential of at least an order of magnitude lower than said source to drain potential,

a plurality of latching means each connected to said high voltage transistor gate electrodes,

data input means for selectively loading a gate potential on said gate electrodes through said latching means, in a fraction of a line time, said latching means holding said gate potential on said high voltage transistors for substantially an entire line time, and

said marking electrodes, said high voltage transistors, said latching means and said data input means being thin film elements integrally formed upon said substrate.

4,588,998

INK JET HEAD HAVING CURVED INK

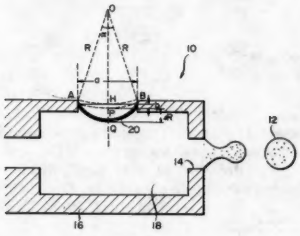
Tetsu Yamamuro, Tokyo, and Kyuhachiro Iwasaki, Fujisawa, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jul. 26, 1984, Ser. No. 634,543

Claims priority, application Japan, Jul. 27, 1983, 58-137247; Jul. 27, 1983, 58-137248; Aug. 10, 1983, 58-146190; Aug. 11, 1983, 58-146867

Int. Cl.⁴ G01D *15/16*

U.S. Cl. 346—140 R **11 Claims**



1. An ink jet head for compressing ink to eject drops of ink, said ink jet head comprising:

(a) a housing;

(b) an ink chamber defined in said housing;

(c) a nozzle defined in said housing and communicating with said ink chamber;

(d) a non-conductive substrate in opposing relationship to said housing;

(e) a first conductive layer deposited on said non-conductive substrate, said first conductive layer being in opposed relationship to said ink chamber, being curved inwardly toward said ink chamber, and having a radius of curvature R; and

(f) a thin film composed of a piezoelectric high molecular substance overlying said first conductive layer and in electrical contact with said first conductive layer,

whereby, when a voltage is applied to said first conductive layer during use of the ink jet head, said thin film flexes further into said ink chamber and forces ink in said ink chamber out through said nozzle.

4,588,999

DEVICE FOR THE FIXING AND CONTACTING OF PIEZOTUBES

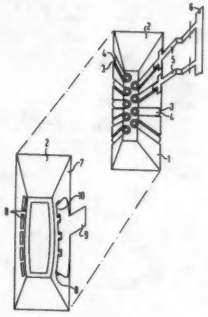
Ingolf Depta, Petershausen, and Wilfried Kindler, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Apr. 1, 1985, Ser. No. 718,613

Claims priority, application Fed. Rep. of Germany, May 18, 1984, 3418636

Int. Cl.⁴ G01D *15/18*; H01L *41/08*

U.S. Cl. 346—140 R **4 Claims**



1. A device for the fixing and contacting of drive elements in the form of piezotubes in the poured recording head of ink printing means comprising a tube carrier having first contact elements, the tube carrier having cut-outs which in their form and position are adapted to the piezotubes in the recording head, the cut-outs for receiving the first contact elements and the piezotubes, and a clamping part having associated second contact elements, the clamping part for receiving the tube carrier by a snapping-in, the clamping part having openings into which the second contact elements can be plugged.

4,589,000

INK JET PRINTER OF THE INK-ON-DEMAND TYPE

Haruhiko Koto; Junichi Okada; Hiroshi Ishii, and Kenji Sawada, all of Shiojiri, Japan, assignors to Epson Corporation, Tokyo, Japan

Division of Ser. No. 541,628, Oct. 13, 1983, abandoned. This application Aug. 12, 1985, Ser. No. 764,813

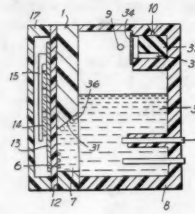
Claims priority, application Japan, Oct. 14, 1982, 57-180176; Dec. 7, 1982, 57-215263; Jan. 17, 1983, 58-5501; Jul. 12, 1983, 58-126668; Jul. 20, 1983, 58-132162; Aug. 23, 1983, 58-153660

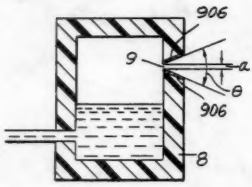
Int. Cl.⁴ G01D *15/16*

U.S. Cl. 346—140 R **1 Claim**

1. An ink-on-demand type ink jet printer comprising an ink jet head assembly having a printer head and an ink container integrally joined to said printer head, said printer head including a pressure chamber and ink supply and ejection flow passages communicating respectively therewith, said ink container having therein a narrow air-bubble blocking tube opening directly into a lower portion of the interior of the ink container and connecting said ink supply flow passage to said

ink container and, a vent hole defined in an upper portion thereof, and a wall surface, said wall surface not trapping air





bubbles, a surface of said vent hole being coated with a defoaming agent.

4,589,001

QUASIPARTICLE INJECTION CONTROL TYPE SUPERCONDUCTING DEVICE

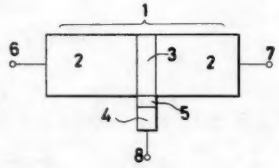
Shigeki Sakai, Sakuramura; Hiroshi Tateno, Yatabemachi, and Shoei Kataoka, Tanashi, all of Japan, assignors to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

Continuation of Ser. No. 281,037, Jul. 7, 1981, abandoned. This application Apr. 26, 1984, Ser. No. 603,984

Claims priority, application Japan, Jul. 9, 1980, 55-93522; Oct. 30, 1980, 55-152904

Int. Cl.⁴ H01L *39/22*

U.S. Cl. 357—5 **12 Claims**



1. A quasiparticle injection control type superconducting device, comprising:

a Josephson junction element formed of a weak link part, a first superconductor joined to one surface of said weak link part and a second superconductor joined to the other surface of said weak link part; and

quasiparticle injecting means provided on at least a portion of said weak link part excluding the portions thereof having said first and second superconductors joined thereto for injecting quasiparticles directly into said weak link part;

whereby injection of quasiparticles causes the current-voltage characteristics of said Josephson element to be controlled.

4,589,002

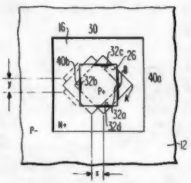
DIODE STRUCTURE

John A. Olmstead, Branchberg Township, Somerset County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Jul. 18, 1984, Ser. No. 631,869

Int. Cl.⁴ H01L *29/06, 29/90, 29/91*

U.S. Cl. 357—13 **13 Claims**



1. A diode comprising a body of semiconducting material having a substantially planar surface, a first region of one conductivity type in said body and extending downwardly from said planar surface, said first region having an opening bounded by a predetermined number of sides through which a portion of said body projects so that said first region encircles said portion of said body, and a second region of the opposite conductivity type within said portion of said body and extending downwardly from said planar surface, said second region bounded by a predetermined number of sides and partialy overlapping said first region so that at least two rectifying junctions exist at the intersections of said first and second regions wherein each of said rectifying junctions has a finite area and is positioned with respect to said first and second regions so that the sum of said finite areas of said rectifying junctions is a constant value independent of the position of said second region with respect to said first region at said planar surface.

4,589,003

SOLID STATE IMAGE SENSOR COMPRISING PHOTOELECTRIC CONVERTING FILM AND READING-OUT TRANSISTOR

Hidetoshi Yamada, Tokyo; Atsushi Yusa, Ina; Takashi Mizusaki, Hamamatsu, and Jun-ichi Nishizawa, Sendai, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 29, 1983, Ser. No. 555,987

Claims priority, application Japan, Dec. 14, 1982, 57-217719

Int. Cl.⁴ H01L *29/80*

U.S. Cl. 357—22 **12 Claims**

1. A solid state image sensor for sensing radiation incident thereon in a first direction generally perpendicular thereto and producing an output level corresponding to the intensity of the incident radiation, comprising:

a semiconductor body having a main surface generally perpendicular to said first direction;

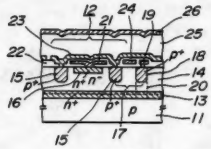
a bottom electrode layer, opaque to said incident radiation, applied on and overlying the main surface of said semiconductor body;

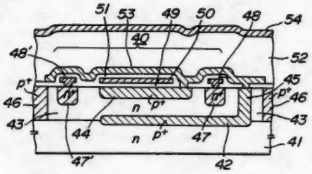
a photoelectric converting film layer applied on and overlying said bottom electrode layer;

a surface electrode layer, transparent to said incident radiation, applied on and overlying said photoelectric converting film layer;

a read-out transistor including drain, gate, and source regions provided in said semiconductor body, said gate region being in ohmic contact with said bottom electrode layer, said read-out transistor being arranged to conduct a source-drain current thereof in said first direction perpendicular to the main surface of said semiconductor body, with one of said source and drain regions providing said output level corresponding to an amplified version of the voltage produced on said bottom electrode layer by the

radiation incident on said photoelectric converting film layer; and





means provided in said semiconductor body for periodically resetting said gate region of said read-out transistor to a predetermined reference potential.

4,589,004

SEMICONDUCTOR DEVICE MONOLITHICALLY COMPRISING A V-MOSFET AND BIPOLAR TRANSISTOR ISOLATED FROM EACH OTHER

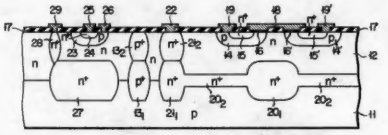
Seiji Yasuda; Toshio Yonezawa, both of Yokosuka; Shunichi Hiraki, Fujisawa, and Masafumi Miyagawa, Kitakyushu, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Continuation of Ser. No. 354,032, Mar. 2, 1982, abandoned. This application Oct. 30, 1984, Ser. No. 665,506

Claims priority, application Japan, Mar. 30, 1981, 56-46906

Int. Cl.[4] H01L *29/78, 27/02*

U.S. Cl. 357—23.4 **3 Claims**



1. A semiconductor device, comprising:

a semiconductor substrate of a first conductivity type;

a semiconductor layer of a second conductivity type opposite to said first conductivity type, said semiconductor layer being formed on said substrate;

an isolation diffusion layer of the first conductivity type selectively formed in said semiconductor layer across said semiconductor layer in its thickness direction so as to divide said semiconductor layer into first and second element regions;

a first inpurity region of the first conductivity type formed in said first element region;

a first electrode formed in ohmic contact with said first impurity region;

a first buried region containing a high concentration of an impurity of the second conductivity type located between the first element region and the substrate, and being of a predetermined thickness with a surface sufficiently close to said first impurity region for providing low series resistance in said first element region;

a second impurity region of the first conductivity type formed in the second element region and having a predetermined depth measured from the surface of the semiconductor layer, said second impurity region being divided into two parts with a portion of said semiconductor layer extending intermediate said two parts of the second impurity region, the surface of said intermediate portion of said semiconductor layer being generally flush with the surface of said two parts of said second impurity region;

a third impurity region of the second conductivity type formed within and extending downward from the surface of each divided part of the second impurity region;

a gate electrode formed over that portion of the semiconductor layer positioned intermediate the divided two parts of the second impurity region and over an inside portion of each of the divided two parts of the second impurity region;

a gate insulation film interposed between said gate electrode and said second impurity region and said intermediate portion of said semiconductor layer, the portion of said gate insulation film directly over said intermediate semiconductor layer portion being thicker than the portions of said gate insulation film directly over said inside portions of the divided two parts of said second impurity region;

a source electrode formed in ohmic contact with said third impurity region;

a second buried region containing a high concentration of an impurity of the second conductivity type located between the second element region and the substrate, said second buried region having a thickened portion below the gate electrode such that the distance between the second buried region and the semiconductor layer surface is sufficiently small for providing low turn-on resistance in said second element region, and further having a thinned portion such that the surface of said thinned portion of said second buried region is sufficiently apart from the second impurity region for providing high voltage withstand characteristics insaid second element region, the thickened portion of the second buried region being positioned right under and being wider than the intermediate part of the semiconductor layer so as to extend under said two parts of said second impurity region;

an electrode take-out region containing a high concentration of an impurity of the second conductivity type impurity and extending from said thinned portion of the second buried region to reach the surface of the semiconductor layer; and

a drain electrode formed in ohmic contact with said electrode take-out region.

4,589,005

CHARGE TRANSFER DEVICE HAVING IMPROVED ELECTRODES

Hajime Matsuda, and Hiroshi Morito, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Jun. 2, 1983, Ser. No. 500,595

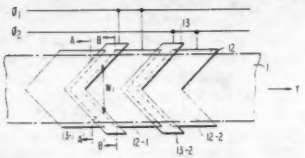
Claims priority, application Japan, Jun. 2, 1982, 57-95506

Int. Cl.[4] H01L *29/78;* **G11C** *19/28*

U.S. Cl. 357—24 **6 Claims**

1. A charge transfer device comprising a semiconductor region of one conductivity type, said semiconductor region having a straight striped shape with two parallel long sides and forming a channel region through which charges are transferred, an insulating layer formed on said semiconductor region and a plurality of electrodes formed on said insulating layer so as to form a row of electrodes along a charge transfer direction, said electrodes being supplied with clock pulses to generate a potential distribution in said semiconductor region for transferring charges and having first and second sides in said charge transfer direction and third and fourth sides parallel to the parallel long sides of said stripe shaped semiconduc-

tor region, said first and second sides having such a shape in plan view that the central portions thereof and more indented



than the other portions thereof in said charge transfer direction.

4,589,006

GERMANIUM DETECTOR PASSIVATED WITH HYDROGENATED AMORPHOUS GERMANIUM

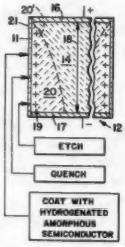
William L. Hansen, Walnut Creek, and Eugene E. Haller, Berkeley, both of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation of Ser. No. 410,786, Aug. 23, 1982, abandoned, which is a division of Ser. No. 188,436, Sep. 19, 1980, abandoned.

This application Nov. 1, 1984, Ser. No. 667,384

Int. Cl.[4] H01L *21/314, 31/10;* **G01T** *1/24*

U.S. Cl. 357—29 **2 Claims**



1. An electrical semiconductor device having a volume of crystalline germanium semiconductor material of predetermined bulk net impurity concentration and having a passivating layer on a surface of said volume of crystalline germanium semiconductor material wherein said passivating layer is a coating comprised of hydrogenated amorphous germanium, said coating having a composition similar to that which is deposited on said surface by sputtering of germanium in an atmosphere of controlled hydrogen content which atmosphere has a pressure of about 7 micromilliliters of mercury and a hydrogen content selected to be in the range of about 7% to about 17.5%, said passivating layer having a hydrogen content selected to passivate undesirable surface states in said crystalline material of said predetermined bulk net impurity concentration.

4,589,007

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

Shigeo Kuboki, Nakaminato; Mitsuhiro Ikeda, Hitachi; Akihiko Takano, Kamakura; Yoji Nishio, and Ikuro Masuda, both of Hitachi, all of Japan, assignors to Hitachi, Ltd. and Hitachi Engineering Co., Ltd., both of Tokyo, Japan

Filed Sep. 6, 1983, Ser. No. 529,764

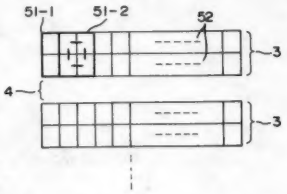
Claims priority, application Japan, Sep. 6, 1982, 57-153921

Int. Cl.[4] H01L *27/10*

U.S. Cl. 357—45 **13 Claims**

1. A semiconductor integrated circuit device utilizing a plurality of unit cells each having at least a basic transistor device formed in one main surface of a substrate, said unit cells being formed into unit cell lines each having a plurality of unit cells arranged in a line in a predetermined direction, said device comprising:

a plurality of basic cell lines arranged in parallel to each other on said semiconductor substrate, with a wiring region of a predetermined width being interleaved between adjacent basic cell lines, wherein each of said basic cell lines is formed of at least two of said unit cell lines arranged adjacent to and in parallel to each other, and further wherein each basic cell of said basic cell line is comprised of at least two of said unit cells,



wherein the unit cells in adjacent ones of said unit cell lines are offset from one another along the direction of said basic cell line.

4,589,008

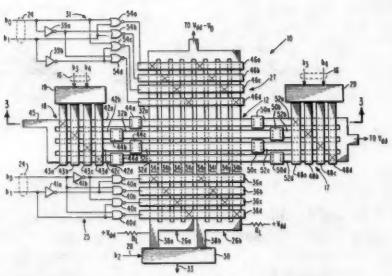
APPARATUS FOR ELECTRICALLY JOINING THE ENDS OF SUBSTANTIALLY PARALLEL SEMICONDUCTOR LINES

Roger G. Stewart, Neshanic Station, N.J., and Moshe Mazin, Andover, Mass., assignors to RCA Corporation, Princeton, N.J.

Continuation-in-part of Ser. No. 116,312, Jan. 28, 1980, abandoned. This application Sep. 4, 1981, Ser. No. 299,344

Int. Cl.[4] H01L *27/12, 23/50*

U.S. Cl. 357—45 **11 Claims**

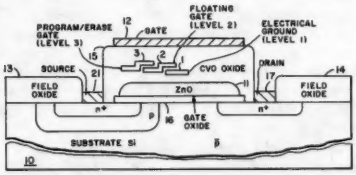


1. Apparatus for electrically joining ends of a first set of substantially parallel lines of one type semiconductor material to adjacent ends of a second set of equal number, substantially parallel lines of a second type semiconductor material, comprising a plurality of metal contacts, each of which overlaps the adjacent ends of one line from each of said sets, said metal contacts being wider than said semiconductor lines in a direction perpendicular to the direction in which said lines extend and being staggered in the direction in which said parallel lines extend in order to enable said metal contacts to overlap the ends of said lines while occupying the minimum space necessary in a direction substantially parallel to the direction in which said substantially parallel semiconductor lines extend.

4,589,009
NON-VOLATILE PIEZOELECTRIC MEMORY TRANSISTOR

Manouchehr E. Motamedi, Thousand Oaks, Calif., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 9, 1984, Ser. No. 659,044
Int. Cl.⁴ H01L *29/78, 29/84, 27/02, 29/04*
U.S. Cl. 357—54 **3 Claims**

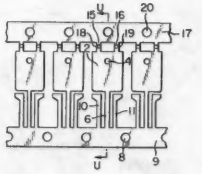


1. In a piezoelectric double diffusion MOS structure having a silicon base with ZnO film thereon and a CVD oxide element between ZnO film and a gate connection; the improvement comprising adding overlapping layers of CVD polysilicon on top of the ZnO film; said overlapping layers being separated by thin oxide layers; said structure being formed on a silicon substrate; one of said overlapping layers is a floating gate which is coupled capacitively to the silicon substrate to form a transistor whereby the presence or absence of a charge on the floating gate determines whether the transistor is on or off; once a charge is on the floating gate the charge will remain trapped as the oxide forms a barrier to the flow of current; and another of the overlapping layers form the function of an erase gate for dissipating a trapped charge in the floating gate.

4,589,010
METHOD FOR MANUFACTURING A PLASTIC ENCAPSULATED SEMICONDUCTOR DEVICE AND A LEAD FRAME THEREFOR

Kenichi Tateno, Shiga; Masami Yokozawa, Kyoto; Hiroyuki Fujii, Osaka; Mikio Nishikawa, Kyoto; Michio Katoh, Osaka, and Fujio Wada, Kyoto, all of Japan, assignors to Matsushita Electronics Corporation, Osaka, Japan

Division of Ser. No. 367,809, Apr. 13, 1982, Pat. No. 4,451,973. This application Feb. 17, 1984, Ser. No. 581,251
Claims priority, application Japan, Apr. 28, 1981, 56-64893; Apr. 30, 1981, 56-64307
Int. Cl.⁴ H01L *23/30, 23/12, 23/10*
U.S. Cl. 357—70 **10 Claims**

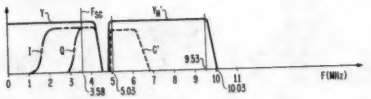


1. A lead frame comprising a first connecting band, a plurality of external leads extending in one direction from said first connecting band, a substrate support having a rear surface and which serves as a heat sink connected at one side thereof to a free end of one of said external leads, a plurality of support strips, each having a portion of small cross-sectional area and being of a predetermined length and extending in a lengthwise direction between portions of larger cross-sectional areas of the respective strip, the cross sections of said portions of small cross-sectional areas being taken perpendicular to said lengthwise direction of said strips, and one end of said strip is connected to another side of said substrate support opposite to the one side connected to said external leads, and a second connecting band extending parallel to said first connecting band with said substrate support disposed therebetween, and connected to opposite ends of said strips, said strips having a smaller thickness than said substrate support and rear surfaces of said strips being at a higher level than the rear surface of said substrate support.

4,589,011
SINGLE SIDEBAND MODULATED CHROMINANCE INFORMATION FOR COMPATIBLE HIGH-DEFINITION TELEVISION

Theodore S. Rzeszewski, Lombard, Ill., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jan. 16, 1984, Ser. No. 571,117
Int. Cl.⁴ H04N *11/06, 11/14, 11/20*
U.S. Cl. 358—12 **19 Claims**



1. A system for decoding high-definition chrominance information of a high-definition baseband video signal having a first baseband signal including low-frequency chrominance information and second baseband signal including high-frequency chrominance information encoded as a plurality of single sideband signals, said system comprises

means for decoding said low-frequency chrominance information;

means for filtering said single sideband signals from said high-definition baseband video signal;

means for synthesizing a plurality of suppressed sideband signals from the filtered single sideband signals;

means for detecting said high-frequency chrominance information from said suppressed sideband signals and said filtered single sideband signals; and

means for adding the decoded low-frequency chrominance information and the detected high-frequency chrominance information to produce said high-definition chrominance information.

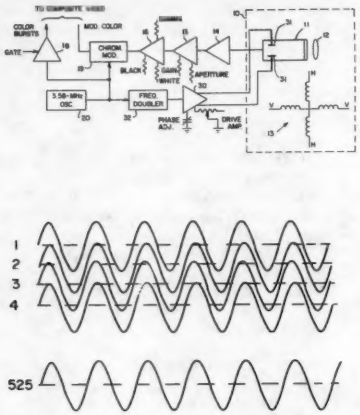
4,589,012
HIGH RESOLUTION TELEVISION

Jimmie D. Songer, Burleson, Tex., assignor to High Resolution Televison, Inc., Los Angeles, Calif.

Continuation-in-part of Ser. No. 364,884, Apr. 2, 1982, abandoned. This application Jul. 19, 1983, Ser. No. 515,220
Int. Cl.⁴ H04N *7/00*
U.S. Cl. 358—12 **8 Claims**

1. In a color television system having a chrominance subcarrier of frequency F, said system being comprised of a color camera and display unit, a method for improving vertical resolution of a video signal produced by said camera, frame by frame, comprising the steps of modulating the vertical beam deflection of said camera at a frequency kF while producing said video signal for each line of a frame, where F is said chrominance subcarrier frequency and k is a multiplying factor which assures that the number of cycles of said modulation frequency occurring in each scan line is a whole number so that modulation from line to line is phase synchronized, and said modulation having a frequency sufficient for causing each line scanned to undulate about the normal straight line scan a significant whole number of cycles, and modulating the vertical beam deflection of said display unit with the same phase and relative amplitude as the modulation of said video signal

for display of each line of a frame in the same pattern as scanned by said camera using said chrominance subcarrier as a



reference for phase synchronizing the modulation of the vertical beam deflection at said display unit.

4,589,013

AUTOMATED ENCODED SIGNAL COLOR IMAGE COMPOSITING

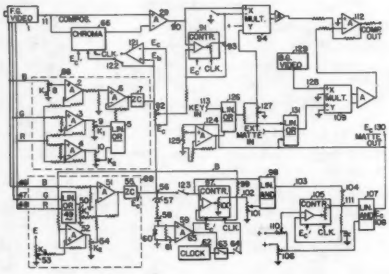
Paul E. Vlahos, Canoga Park; Petro Vlahos, Redway, and David F. Fellinger, Westlake Village, all of Calif., assignors to 501 Ultimatte Corporation, Reseda, Calif.

PCT No. PCT/US83/00933, § 371 Date Jun. 13, 1983, § 102(e) Date Jun. 13, 1983, PCT Pub. No. WO84/05007, PCT Pub. Date Dec., 1984

PCT Filed Jun. 13, 1983, Ser. No. 520,067

Int. Cl.[4] H04N *5/22, 9/535*

U.S. Cl. 358—22 **40 Claims**



1. A method of automatically controlling the compositing of encoded color image background scene and foreground scene video signals involving a background scene and a foreground scene having a foreground subject placed before a colored backing, which comprises the steps of;

(a) forming a first control signal E_b as a function of the brightness and visibility of the colored backing and also as a function of a secondary illumination on the foreground subject received from the colored backing, said first control signal E_b being input to a foreground video subtraction circuit;

(b) forming a second control signal E_c as a function of the brightness and visibility of the colored backing, but not as a function of the secondary illumination being reflected from the foreground subject, said second control signal E_c being input to a background video level control circuit;

(c) forming a gating pulse identifying that portion of the foreground scene representing the colored backing;

(d) comparing and automatically controlling the phase-angle of a generated subcarrier signal to match the phase-angle of a foreground video subcarrier signal during said gating pulse;

(e) comparing and automatically controlling the level of the generated subcarrier signal to match the level of the foreground video subcarrier signal during said gating pulse;

(f) removing the chroma of the colored backing, and discoloration chroma from the foreground subject resulting from the secondary illumination by subtracting the phase and level matched generated subcarrier under control of the first control signal E_b from the foreground scene video signal;

(g) automatically comparing and adjusting the level of the second control signal E_c to match the level of the foreground scene video signal during the gating pulse;

(h) removing the luminance of the colored backing from the foreground scene video signal by subtracting the adjusted level of the second control signal E_c from the foreground scene video signal;

(i) comparing the second control signal E_c during the gating pulse, with a predetermined constant and automatically adjusting the level of said second control signal E_c to match the level of the constant; and

(j) combining the foreground scene video signal, the colored backing chroma and luminance thereof having been removed, with the background scene video signal, the level of which has been controlled by the second control signal, to form a composite video image.

4,589,014

COLOR INDUSTRIAL TELEVISION CAMERA DEVICE FOR USE IN A GAMMA RAY ENVIRONMENT HAVING A LENS SYSTEM WITH A SPECTRAL TRANSMITTANCE CHARACTERISTIC TO ENABLE ACHIEVING WHITE BALANCE

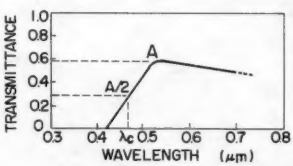
Yoshitoshi Ito, Ome; Yuji Takahashi, Kokubunji; Morikazu Ayugai, Higashikurume; Katsuhiro Mizuno, Tokyo, and Atomi Noguchi, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 12, 1983, Ser. No. 541,244

Claims priority, application Japan, Oct. 15, 1982, 57-179850

Int. Cl.[4] H04N *9/535, 9/04*

U.S. Cl. 358—29 **7 Claims**



1. A color industrial television camera device for use in a gamma ray environment comprising a lens system for passing therethrough light representative of an optical image, color separating means responsive to the light having passed through said lens system for producing three color component electric signals representative of first, second and third color components of said light representative of the optical image, respectively, and means for amplifying said color component electric signals, in which said lens system has a spectral transmittance characteristic such that the wavelength of light passing through said lens system for which said lens system has a transmittance substantially equal to one-half of its maximum transmittance in the visible light wavelength region is shorter than about 0.48 μm on the relatively shorter wavelength side

of the maximum transmittance wavelength in the visible light wavelength region.

4,589,015

COLOR TELEVISION CAMERA WITH BIAS LIGHT DEVICE FEATURING REDUCED COLOR SHADING

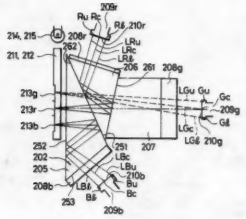
Kazuo Nakata; Jun Hosoya; Shigeru Ohshima, and Takeshi Sekiguchi, all of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 31, 1983, Ser. No. 499,537

Claims priority, application Japan, Jun. 2, 1982, 57-82038[U]; Oct. 14, 1982, 57-155878[U]; Oct. 14, 1982, 57-155879[U]

Int. Cl.[4] H04N *9/097, 9/09;* **G02B** *27/14*

U.S. Cl. 358—55 **8 Claims**



1. A television camera comprising:

an objective lens system;

color resolving optical means for cooperating with said objective lens system to form a plurality of colored images, said color resolving optical means having at least one dichroic film;

a plurality of image receiving means for receiving respective colored images formed by said color resolving optical means; and

illuminating means for independently illuminating said plurality of image receiving means through said color resolving optical means by component light beams each comprised of a plurality of diverging light rays which strike said dichroic film at different angles of incidence, said component light beams having different respective wavelength ranges, each said range being sufficiently narrow that color shading due to the different angles of incidence of said plurality of diverging light rays relative to said dichroic film is substantially eliminated.

4,589,016

FM TELEVISION SIGNAL RECEIVING CIRCUIT

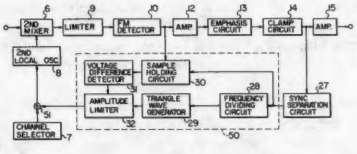
Masaki Noda; Keiro Shinkawa, both of Yokohama; Takeshi Saitoh, Tokyo; Hiroshi Hatashita, Yokohama, and Shigeo Matsuura, Chigasaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 28, 1983, Ser. No. 508,467

Claims priority, application Japan, Jun. 28, 1982, 57-109709

Int. Cl.[4] H04K *1/02;* **H04N** *7/167*

U.S. Cl. 358—118 **5 Claims**



1. A receiving circuit for receiving an FM-modulated television signal with an energy dispersal signal superposed thereon, comprising:

(a) a channel select circuit for generating a channel select voltage which differs depending on a channel of a television signal to be received;

(b) a local oscillating circuit for oscillating a local oscillation signal with a frequency which differs depending on a channel select voltage supplied from said channel select circuit;

(c) a mixing circuit which is supplied with the FM-modulated television signal in a first frequency band and a local oscillation signal from said local oscillating circuit, and converts the FM-modulated television signal in the first frequency band into the FM-modulated television signal in a second frequency band;

(d) a detector circuit for FM-detecting the FM-modulated television signal in the second frequency band supplied from said mixing circuit and converting it into a composite video signal; and

(e) a circuit for generating a signal for supressing an energy dispersal signal, in which said circuit generates a triangle wave signal proportional to the amplitude of the energy dispersal signal in synchronism with the energy dispersal signal contained in the composite video signal applied and supplies the triangle wave signal to said local oscillating circuit to vary the frequency of the local oscillation signal.

4,589,017

PAY TELEVISION RECEIVING SYSTEM

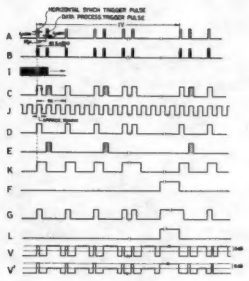
Katsumi Tobita, 39-2, Aza-Yomogida, Dohzuki, Soma-shi, Fukushima-ken, Japan

Filed Mar. 30, 1982, Ser. No. 363,473

Claims priority, application Japan, Apr. 2, 1981, 56-49882

Int. Cl.[4] H04N *7/167*

U.S. Cl. 358—120 **8 Claims**



1. A pay television receiving system comprising:

means including a frequency converter for converting a pay television signal into an intermediate frequency signal said pay television signal being comprised of a video signal with a horizontal synchronizing pulse defeated by elevated portions of the video signal containing picture information, and an aural signal with a horizontal synchronizing trigger pulse and a data processing trigger pulse superposed thereon;

a switching attenuator adapted to receive the output signal of said frequency converter and having means for attenuating said intermediate frequency signal to a predetermined level for a desired time on the basis of a control signal;

means including a data receiver for extracting part of an aural intermediate frequency signal from said intermediate frequency signal delivered by said frequency converter and detecting said horizontal synchronizing trigger pulse and said data processing trigger pulse; and

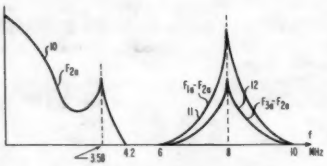
means including a data processing circuit for forming synchronizing pulses by comparing a digital code formed of the data processing trigger pulses provided from said data receiver and a code specified for a pay television reception subscriber and stored in a ROM device, to judge whether or not a pay television channel is contracted, and supplying said switching attenuator in case of the contracted pay television channel with a control signal adapted to attenuate those elevated portions of said video signal cotaining picture information by the predetermined level to form synchronizing pulses between the attenuated portions of said video signal and in case of the uncontracted pay television channel with the control signal to pass said intermediate frequency signal with no loss.

4,589,018

TECHNIQUE FOR THE TIME FREQUENCY MULTIPLEXING ON THREE TELEVISION SIGNALS

Barin G. Haskell, Tinton Falls, and Robert L. Schmidt, Wanamassa, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 3, 1983, Ser. No. 500,957
Int. Cl.[4] H04N *7/08*
U.S. Cl. 358—142 **17 Claims**



4. A television signal transmitter comprising:

switching means responsive to a concurrent reception of first, second and then third successive fields of three television picture signals from first, second and third television sources for sequentially routing (a) said concurrent first, fields from the first, second and third television sources over a first, second and third separate path, respectively, (b) said concurrent second fields from the first, second and third television sources over the second, third and first separate path, respectively, and (c) said concurrent third fields from the first, second and third television sources over the third, first and second separate paths respectively,

first delay means disposed in the first separate path for providing a delay approximately equal to the time period for two of the successive fields of the television picture signal from a television source,

second delay means disposed in the second path for providing a delay approximately equal to the time period for one of the successive fields of the television picture signal from a television source;

means (**36–38**, FIG. **3**, **64–66**, FIG. **5**, **36–37**, **140**, FIG. **9** and **164**, **166**, **167**, FIG. **12**) for concurrently generating from the signals from the first and second delay means and the signal on the third path, a first output signal comprising one of said fields of the television picture signal as is found on one of the three separate paths in the baseband of a standard television system signal, a second output signal which comprises a first differential signal derived from said one and a second of said fields of the television picture signal found on the one of the three separate paths and a second one of the three paths, which second output signal is modulated via quadrature amplitude modulation (QAM) onto a subcarrier frequency above said baseband, and a third output signal which comprises a second differential signal derived from said one and a third of said fields of the television picture signal found on the one of the three separate paths and a third one of the three paths, which third output signal is modulated via QAM onto said subcarrier frequency above said baseband with a different quadrature component than said first differential signal; and

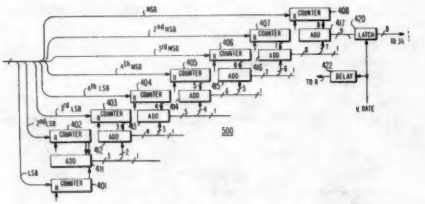
means (FIG. **5**) for combining the concurrent first, second and third output signals from the generating means associated with each of the three television sources into a transmitter output signal including a time division multiplexed format for the three television sources for transmission to a remote receiver.

4,589,019

DIGITAL ADDER INCLUDING COUNTER COUPLED TO INDIVIDUAL BITS OF THE INPUT

Robert A. Dischert, Burlington, N.J., and Robert J. Topper, Rockledge, Pa., assignors to RCA Corporation, Princeton, N.J.

Filed Apr. 22, 1983, Ser. No. 487,862
Int. Cl.[4] H04N *5/14, 5/202*
U.S. Cl. 358—160 **20 Claims**



1. A digital signal averaging arrangement comprising:

a first plurality of binary counting means equal in number to the number of bits in each word of the digital signal to be averaged, each of said counting means having its input coupled for receiving bits of a particular significance of said digital signal, each of said counting means including a plurality of output terminals derived from particular counting stages;

first digital adding means coupled to said plurality of output terminals of that counting means coupled for counting the least-significant bit of said digital signal and coupled to said output terminals of that counting means coupled for counting the second-least-significant bit for adding together the signals appearing at said output terminals of said least-significant and second-least significant counting means;

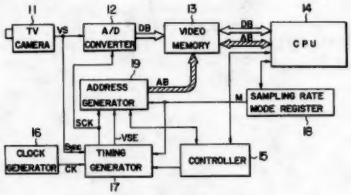
a second plurality of digital adding means equal to two less than the total number of said first plurality of counting means, each of said second plurality of digital adding means of a particular significance being coupled to receive as an input the output of the next lower significance digital adding means, and also coupled to the output of a counting means of a like significance; and

coupling means coupled to the output of that digital adding means having the highest significance for extracting therefrom a signal representative of the average value of said digital signal.

4,589,020
TV VIDEO DATA INPUT APPARATUS

Yuichiro Akatsuka, Tama, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 22, 1983, Ser. No. 554,463
Claims priority, application Japan, Nov. 22, 1982, 57-203568; Jul. 14, 1983, 58-128497
Int. Cl.⁴ H04N *5/14*
U.S. Cl. 358—160 **4 Claims**



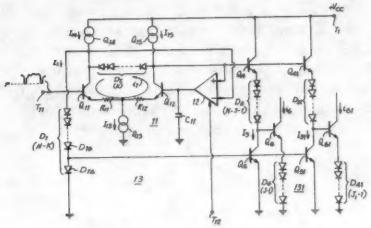
1. A TV video data input apparatus comprising:
a TV camera for producing a video signal;
means for generating sampling clock signals in a plurality of modes different from each other on the basis of a reference clock;
a sampling rate mode register means for selecting a mode of said clock signals corresponding to characteristics of a TV picture, said sampling rate mode register being controlled by a CPU in a computer;
an A/D converting means for quantizing said video signal through A/D conversion on receipt of said sampling clock signals;
a memory having a short access time or a memory having a long access time provided in the computer for storing the output from said A/D converting means; and
a writing means, operatively connected with said memory and said means for generating clock signals, for writing in said memory the output from said A/D converting means,
whereby the writing of the output from said A/D converting means into said memory having a short access time at a high speed and that into said memory having a long access time at a low speed can be switched over from one to the other by selectively changing the mode of said sampling clock signals.

4,589,021
GAMMA COMPENSATING CIRCUIT

Joichi Sato, Atsugi; Ryuji Shiono, Machida; Tsutomu Niimura, Hiratsuka; Toshiaki Isogawa, and Mitsuru Sato, both of Atsugi, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jan. 4, 1984, Ser. No. 568,258
Claims priority, application Japan, Jan. 7, 1983, 58-861; Jan. 14, 1983, 58-3760
Int. Cl.⁴ H04N *5/202, 5/57, 9/69*
U.S. Cl. 358—164 **20 Claims**

1. A circuit having a nonlinear response characteristic for compensating an input signal, comprising:
differential amplifier means receiving said input signal at one input and producing an output signal therefrom at an output;
a first diode circuit connected between said differential amplifier means output and a reference potential;
first current-source means connected to supply a constant current to said differential amplifier means and also to said first diode circuit;
a second diode circuit connected to said differential amplifier means output;
current maintenance means connected to said first diode circuit and to said second diode circuit for maintaining a current flow in said second diode circuit equal to a current flow in said first diode circuit;
a third diode circuit; and

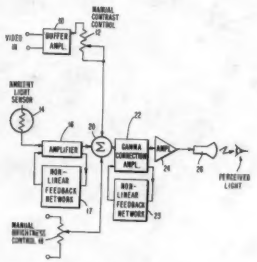


output circuit means having an input connected to said second diode circuit and being connected to said reference potential through said third diode circuit for producing an output signal representing said input signal having been nonlinearly compensated.

4,589,022
BRIGHTNESS CONTROL SYSTEM FOR CRT VIDEO DISPLAY

John S. Prince, Vestal; Harold L. Herz, and Edward P. Coleman, Jr., both of Binghamton, all of N.Y., assignors to General Electric Company, Binghamton, N.Y.

Filed Nov. 28, 1983, Ser. No. 555,791
Int. Cl.⁴ H04N *5/202, 5/58*
U.S. Cl. 358—168 **9 Claims**



1. A brightness control system for a cathode ray tube video display, comprising:
video information signal receiving means for receiving a video information signal including contrast control means for controlling the gain of said video information signal;
ambient light signal generating means including an ambient light sensor means for providing a signal representation of the level of ambient light in a viewed scene, and a nonlinear amplifier connected to the output of said ambient light sensor means to provide an amplified ambient light signal which is in proportion to a logarithm of the ambient light level;
manual brightness control signal means for providing a manually adjusted brightness control signal;
a summing means connected to receive the output of said video information signal receiving means, said nonlinear amplifier and said manual brightness control signal means, thereby providing a summation signal therefrom which corresponds to a logarithmic addition of said signals;
nonlinear gamma correction amplifier means connected to receive said summation signal from said summing means;
video driver amplifier means connected to the output of said nonlinear gamma correction amplifier means; and

cathode ray tube means connected to said video driver amplifier means;

said gamma correction amplifier means, said video driver amplifier means and said cathode ray tube means in combination having an exponential transfer function which is an antilogarithmic function of said summation signal appearing at the input to said nonlinear gamma correction amplifier means, whereby a perceived screen image on said cathode ray tube means has a brightness and contrast that is associated with a linear said summation signal being fed into said gamma correction amplifier means.

4,589,023

ELECTRONIC CAMERA

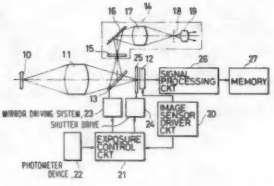
Shigeo Suzuki; Kiyoshi Kawano; Kimiaki Ogawa, and Harumi Aoki, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 20, 1983, Ser. No. 563,489

Claims priority, application Japan, Dec. 20, 1982, 57/223546; Jan. 19, 1983, 58/6870

Int. Cl.[4] H01N *3/14*

U.S. Cl. 358—213 **5 Claims**



1. An electronic camera comprising: an optical viewfinder system; an image pickup device for photoelectrically converting the image of an object focused by a photographic lens; a memory for storing an image signal generated by said image pickup device; a shutter for controlling the flux of light from the object image falling on said image pickup device; an exposure control device for controlling an exposure through said shutter dependent on the brightness of the object image; a quick-return mirror normally positioned in a path of the flux of light from the object image for guiding the flux of light into said optical viewfinder system, said quick-return mirror being retractable out of said path for allowing the flux of light to fall on said image pickup device; a release switch for generating a photographing start signal; and a vertical synchronizing signal generator for issuing a vertical synchronizing signal aperiodically to said image pickup device, said vertical synchronizing signal generator comprising means for issuing a signal for discharging electric charges stored in said image pickup device after said release switch has been turned on and before said quick-return mirror starts being retracted out of said path and for issuing a signal for reading out electric charges which have been stored in said image pickup device while said shutter is being open after an exposure operation has been finished by said shutter.

4,589,024

TWO-DIMENSIONAL SEMICONDUCTOR IMAGE SENSOR WITH REGULATED INTEGRATION TIME

Rudolf Koch, Unterhaching, and Heiner Herbst, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

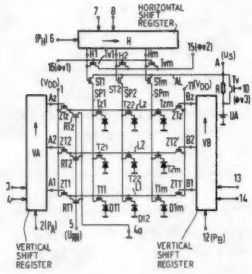
Filed Aug. 19, 1982, Ser. No. 409,628

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1981, 3138240

The portion of the term of this patent subsequent to Jan. 29, 2002, has been disclaimed.

Int. Cl.[4] H04N *3/12*

U.S. Cl. 358—213 **16 Claims**



1. A two-dimensional semiconductor image sensor comprising:

a plurality of light-sensitive sensor elements for generating charge carriers in response to light incident thereon, said sensor elements disposed in rows and columns on a semiconductor substrate;

a plurality of row lines respectively connecting all sensor elements in each of said rows;

a plurality of column lines respectively connecting all sensor elements in each of said columns;

a first vertical shift register having a plurality of parallel outputs for sequentially selecting said rows of sensor elements for readout thereof over said column lines at a sensor output;

a plurality of first row selection transistors respectively interconnected between one end of said row lines and a constant voltage and each having a control electrode connected to one of said parallel outputs of said first vertical shift register;

a second vertical shift register having a plurality of parallel outputs for sequentially selecting said rows of sensor elements for readout thereof over said column lines at said sensor output;

a plurality of second row selection transistors respectively interconnected between the other end of said row of lines and a constant voltage and each having a control electrode connected to one of said parallel outputs of said second vertical shift register;

a means for periodically connecting said column lines to said sensor output; and

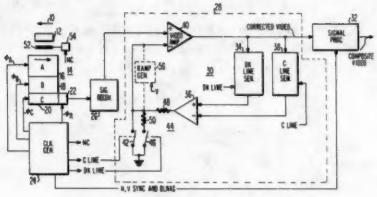
a means for periodically connecting said sensor output to a constant voltage, whereby said first vertical shift register periodically effects a first readout of a selected duration of said rows of sensor elements and said second vertical shift register periodically effects a subsequent second readout of said rows of sensor elements only when said sensor output is connected to a constant voltage.

4,589,025

DARK CURRENT MEASUREMENT AND CORRECTION FOR VIDEO FROM FIELD-TRANSFER IMAGERS

John F. Monahan, Burlington County; Joseph F. Hacke, Camden County, and Thomas F. Casne, Burlington County, all of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Nov. 30, 1984, Ser. No. 676,815
Int. Cl.[4] H04N *5/16*
U.S. Cl. 358—213 **10 Claims**



1. Apparatus for deriving a signal indicating the level of dark current accompanying a video signal supplied from a field-transfer type solid-state imager including A, B, and C registers, comprising:

means for developing a first signal substantially representative of only dark current response accumulated in a first portion of said imager;

means for developing a second signal substantially representative of only dark current response accumulated in a second portion register of said imager, and

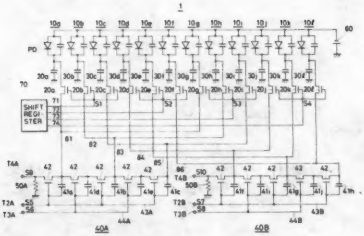
means for comparing said first and second signals for developing said indicating signal.

4,589,026

IMAGE SENSOR

Takashi Ozawa, and Mutsuo Takenouchi, both of Ebina, Japan, assignors to Fuji Xerox Co., Ltd., Japan

Filed Aug. 8, 1983, Ser. No. 521,104
Claims priority, application Japan, Aug. 16, 1982, 57-141826
Int. Cl.[4] H04N *1/10*
U.S. Cl. 358—213 **7 Claims**



1. An image sensor having photoelectric conversion element's comprising:

(a) a plurality of bottom layer electrodes disposed on a substrate;

(b) a photoconductive layer which is disposed on said bottom layer electrodes;

(c) top layer electrode which is disposed on said photoconductive layer to form a plurality of photoelectric conversion elements;

(d) a plurality of thin film transistors provided in one-to-one correspondence to said photoelectric conversion elements for switching the outputs of said photoelectric conversion elements, said thin film transistors being divided into odd and even numbered blocks of adjoining thin film transistors, each of said thin film transistors having a gate electrode, the gate electrodes of the transistors in each group of said adjoining thin film transistors in the same block being mutually connected;

(e) block sequence means for sequentially supplying to the blocks switching signals coupled to the group of mutually connected gate electrodes;

(f) a first connection line group having outputs and mutually connecting the output electrodes of said thin film transistors located in corresponding positions in each odd numbered block;

(g) a second connection line group having outputs and mutually connecting the output electrodes of said thin film transistors located in corresponding positions in each even numbered block;

(h) a first charge transfer circuit comprising MOS transistors for sequentially transferring for each block photoelectric conversion outputs from said first connection line group; and

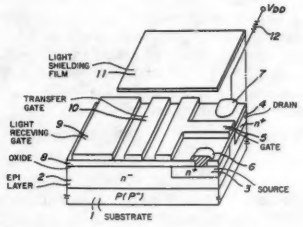
(i) a second charge transfer circuit including MOS transistors for sequentially transferring for each block photoelectric conversion outputs from said second connection line group.

4,589,027

SOLID STATE IMAGE SENSOR

Tsutomu Nakamura, and Kazuya Matsumoto, both of Ina, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jun. 12, 1985, Ser. No. 743,774
Claims priority, application Japan, Jun. 19, 1984, 59-124590
Int. Cl.[4] H04N *3/12*
U.S. Cl. 358—213 **9 Claims**



1. A solid state image sensor comprising a plurality of image sensing elements, each image sensing element including

a laterial type static induction transistor having a source and drain regions formed in a surface of a semiconductor body, and a signal readout gate means at least a part of which is formed between the source and drain regions;

a light receiving gate means formed separately from the signal readout gate means and constituting a photoelectric converting region;

a transfer gate means formed between the signal readout gate means and the light receiving gate means; and

a light shielding film applied on the semiconductor body except for the light receiving gate means.

4,589,028

DEFECT CONCEALING IMAGE SENSING DEVICE

Shige Ochi, San Jose, Calif., assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 29, 1983, Ser. No. 555,919
Int. Cl.[4] H04N *3/14*
U.S. Cl. 358—213 **6 Claims**

3. An image sensing device comprising:

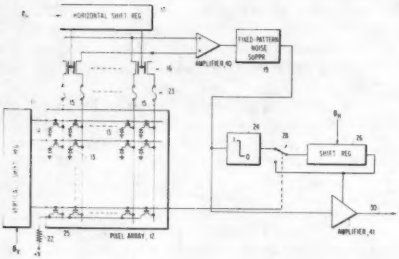
a photosensor array comprising first and second sets of conductors, conductors of said first and second sets being parallel within said sets and perpendicular between said sets, and photosensing elements arranged in lines at inter-

sections between said conductors of said first and second sets;

means for sequentially activating said conductors of said first set to read out image information sensed by said photosensing elements onto said conductors of said second set one line of said photosensing elements at a time;

means for sequentially coupling said conductors of said second set to at least one array output terminal to produce an uncorrected video output signal;

means for storing information indicative of which, if any, of said conductors of said second set have an associated defect; and



means, operating in response to said storing means, for substituting for segments of said video output signal corresponding to conductors of said second set having an associated defect a signal segment corresponding to an adjacent conductor of said second set to thereby produce a corrected video signal; and

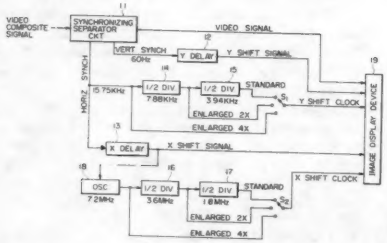
wherein said photosensor array further comprises a line of dummy photosensing elements, one of said dummy photosensing elements being provided for each conductor of said second set, said line of dummy photosensing elements being coupled to said activating means to be activated in sequence with said conductors of said first set.

4,589,029

ELECTRONIC VIEWFINDER

Yasuo Torimaru, and Masahiro Yoshimura, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 8, 1983, Ser. No. 530,468
Claims priority, application Japan, Sep. 12, 1982, 57-216343
Int. Cl.⁴ H04N *5/30*
U.S. Cl. 358—224 **9 Claims**



9. An electronic viewfinder connected to receive a video composite signal, comprising:

first means for displaying an image; and

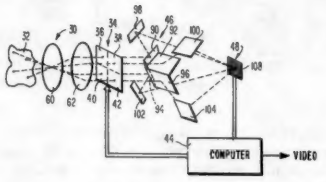
second means, operatively connected to said first means and connected to receive the video composite signal, for providing a video signal to said first means, said second means including switching means for providing first and second control signals to said first means, said switching means providing the first control signal when said first means is to be operated in a standard display mode to set the angle of view, said switching means providing the second control signal when said first means is to be operated in a magnification display mode for focusing, said first means displaying a selected portion of the image which is magnified by a selected magnification when said first means is operated in the magnification display mode.

4,589,030

SOLID STATE CAMERA

Victor B. Kley, 1119 Park Hill Rd., Berkeley, Calif. 94708

Filed Jul. 25, 1983, Ser. No. 516,466
Int. Cl.⁴ G01B *11/26*; H01J *3/14*
U.S. Cl. 358—225 **11 Claims**



1. An electronic camera comprising:

a linear array of solid state light detectors, planar electro-optic mask means for defining different narrow slit-like image regions extending across the mask means and including electrically operated means for selectively passing light through the different image regions of the mask, said image regions each dimensionally corresponding to the array of light detectors,

objective means for projecting an image of an object on a first side of the mask means,

optic means for superimposing the different image regions from the second side of the mask means into a single line image which is collinear with the array of light detectors wherein each portion of the single line image includes the corresponding superimposed portions of all of the different slit-like image regions from the mask means, and

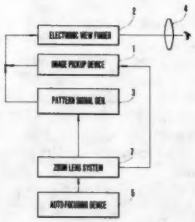
electrical processing means for operating the mask means and for reading the array of light detectors to produce electrical signals corresponding to the image of the object.

4,589,031

VIDEO CAMERA

Sadahiko Tsuji, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 22, 1983, Ser. No. 506,669
Claims priority, application Japan, Jun. 30, 1982, 57-112745; Jun. 30, 1982, 57-112746; Jun. 30, 1982, 57-112747
Int. Cl.⁴ H04N *5/232, 5/30*
U.S. Cl. 358—227 **10 Claims**



1. A video camera comprising:

(A) image pick-up means including a focus adjustable lens

system and for producing a video signal representative of an image of an object, said lens system defining an optical path;

(B) focus detecting means for detecting the focus of said lens system relative to said object, said detecting means having a field of view;

(C) pattern generating means for generating a pattern signal indicative of said field of view of said focus detecting means;

(D) display means responsive to said video signal and said pattern signal for displaying the object image and the field of view of the focus detecting means; and

(E) adjusting means for adjusting said pattern signal generated from said pattern generating means; and

(F) said focus detecting means being arranged to produce a distance signal indicative of a distance to the object, and said adjusting means being responsive to said distance signal and being arranged to adjust said pattern signal in accordance with the object distance.

4,589,032

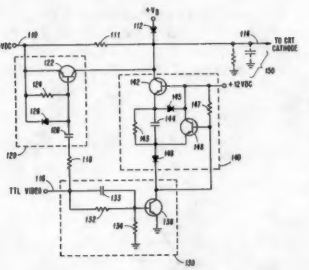
ULTRA LOW POWER VIDEO AMPLIFIER

William A. Morey, Marion, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 5, 1984, Ser. No. 596,888

Int. Cl.[4] H04N *5/68, 5/14, 5/34*

U.S. Cl. 358—242 **3 Claims**



1. A video amplifier circuit comprising, in combination:

a. an amplifier circuit means responsive to a logic input for providing a control video signal output;

b. first means, coupled to said circuit means, for accelerating said response to an ON condition at said output;

c. second means, coupled to said circuit means, for accelerating said response to an OFF condition at said output; and

d. third means, a portion thereof coupled to said first means and a second portion thereof coupled to said second means, for accelerating the recovery of said circuit means to said responsive ON and OFF conditions at said output, thereby improving said response for subsequent logic inputs.

4,589,033

METHOD AND APPARATUS FOR INTERRUPTING A FACSIMILE TRANSMISSION

Jack D. Burton, Orlando, and F. Peter Tyrrell, Altamonte Springs, both of Fla., assignors to Ricoh Company Ltd., Tokyo, Japan

Filed Feb. 11, 1980, Ser. No. 120,342

Int. Cl.[4] H04N *1/32*

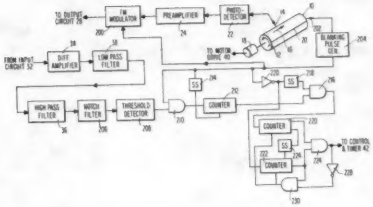
U.S. Cl. 358—257 **4 Claims**

1. A facsimile transmitting apparatus for transmitting signals representing dark/light variations in a document, comprising:

sensor means for detecting dark/light variations in a document at the transmitting apparatus;

transmitting means for generating and transmitting signals including signals representing the dark/light variations in the document to be transmitted to a remotely located receiver, said transmitting signals having a varying frequency content;

receiving means for detecting received signals including an interrupt signal of predetermined frequency content from the remotely located receiver, said interrupt signal indicating that the receiver has interrupted reception of transmitted signals while said transmitting means is simultaneously generating and transmitting said transmitting signals; and



control means coupled to said transmitting means and to said receiving means for interrupting transmission of said transmitting signals, said control means including means for detecting the presence of said predetermined frequency during successive blanking periods when said transmitting means is not transmitting said signals representing said dark/light variations, said control means interrupting transmission only after detecting the presence of said predetermined frequency during a predetermined number of successive blanking periods.

4,589,034

IMAGE PROCESSING APPARATUS

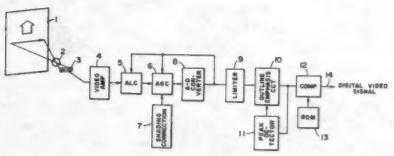
Yoshikazu Yokomizo, Kawagoe, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 1, 1981, Ser. No. 326,269

Claims priority, application Japan, Dec. 5, 1980, 55-171878; Dec. 5, 1980, 55-171879; Dec. 5, 1980, 55-171880; Dec. 5, 1980, 55-171881; Dec. 5, 1980, 55-171882; Dec. 5, 1980, 55-171883

Int. Cl.[4] H04N *1/40*

U.S. Cl. 358—234 **15 Claims**



1. An image processing apparatus comprising:

means for generating an analog image signal representative of an image density;

converter means for converting an analog image signal generated by said generating means to a digital signal composed of a plurality of bits, said digital image signal being representative of an image density;

limiter means for limit-converting the digital image signal produced by said converter means into a distinct digital image signal having a specified digital value if a digital value of the digital image signal is outside a predetermined level range, and for outputting the digital image signal without limit-conversion if a digital value of the digital image signal is within the predetermined level range, so as to eliminate the noise component from the digital image signal; and

process means for processing the digital image signal output

from said limiter means to emphasize an outline of the image represented by the digital image signal.

4,589,035

MULTIPLE COPY IMAGE FORMING APPARATUS AND METHOD

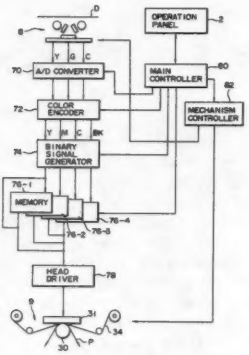
Eiichi Yamanishi, Yokohama; Kenichi Oono, Kawasaki; Masami Gokita, Tokyo; Kenji Futaki, Kawasaki, and Junji Watanabe, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 18, 1984, Ser. No. 632,220

Claims priority, application Japan, Jul. 29, 1983, 58-138825

Int. Cl.[4] H04N *1/23, 1/04;* **G03G** *15/01;* **G01D** *15/06*

U.S. Cl. 358—296 **18 Claims**



1. An image forming apparatus comprising:

scanner means for optically scanning a document once and generating an image signal related to an image on said document said image signal including a plurality of color component signals;

memory means for storing said image signal and providing a stored signal related to said image signal;

image forming means for forming a first full color image on an image forming medium based on one of said plurality of color component signals and said stored signal; and

image forming control means for supplying a first one of said color component signals to said image forming means for a first image formation simultaneously with said scanning, and for supplying the remaining color component signals only to said memory means to cause said stored signal to be supplied to said image forming means for a second and any subsequent image formations.

4,589,036

APPARATUS AND METHOD FOR INSTRUMENTED RADIAL TRANSLATION OF A READ/WRITE TRANSDUCER AT START-UP OF A ROTATING DISK FILE

John R. Bertschy; T. Jay Cameron; Kenneth L. Deckert, and Sylvia L. Lee, all of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 3, 1984, Ser. No. 677,761

Int. Cl.[4] G11B *5/54*

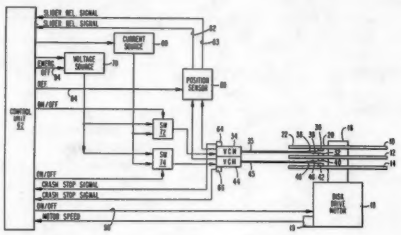
U.S. Cl. 360—75 **13 Claims**

1. A method of controlling the rotation of a disk in a disk file of the type having a rotatable data storage disk, a head for reading or writing data onto the disk and an actuator attached to the head for moving the head over the surface of the disk, wherein the head is in contact on the disk surface when the disk is at rest and rides on a bearing of air above the disk surface when the disk rotates at its operational speed, the method comprising the steps of:

moving the head radially;

sensing the position of the head;

initiating rotation of the disk when the head has moved a predetermined radial distance; and



continuing to move the head radially until the disk is rotating at a predetermined speed.

4,589,037

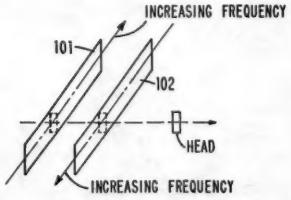
SERVO CONTROL SYSTEM USING A VARYING FREQUENCY SERVO PATTERN FOR READ/WRITE HEAD POSITIONING IN A MAGNETIC RECORDING DISK FILE

Shen Jen, Richardson, Tex.; William J. Kabelac, Morgan Hill, and Ian L. Sanders, San Jose, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 18, 1985, Ser. No. 713,139

Int. Cl.[4] G11B *5/55, 5/56*

U.S. Cl. 360—77 **11 Claims**



11. An improved flexible disk for magnetic recording wherein the improvement comprises a group of radially spaced segments of servo information recorded on the flexible disk, each segment extending radially over at least one track and comprising magnetic transitions which increase in frequency in a radial direction, whereby the number of magnetic transitions at any one radial location within a segment provides a unique indication of radial position within the segment.

4,589,038

POSITION SENSOR

Ernst-Rudolf Radtke, Erlensee, Fed. Rep. of Germany, assignor to Honeywell GmbH, Fed. Rep. of Germany

Filed Jun. 28, 1984, Ser. No. 625,748

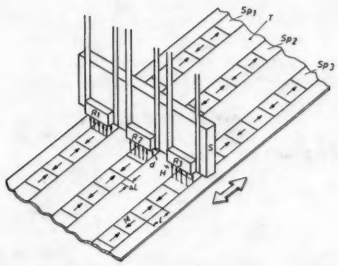
Claims priority, application Fed. Rep. of Germany, Jul. 14, 1983, 3325353

Int. Cl.[4] G01B *7/02*

U.S. Cl. 360—79 **11 Claims**

1. Apparatus for sensing the position of a movable part comprising n magnetic tracks consisting of individual elements having a length L, with said track being phase-shifted by a value $\Delta L = L/n$ with respect to each other and comprising a sensor arranged over said magnetic tracks and including resistors for sensing the magnetic field, whereat the distance d of said resistors from said magnetic tracks does not essentially exceed the length L, characterized in that the number $n > 1$ of

the magnetic tracks (Sp_1, Sp_2, Sp_3) is determined by the resolution power of the position sensor (Sp_1, Sp_2, Sp_3; R_1, R_2, R_3)



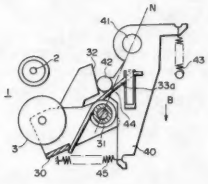
and the required distance $d < L$ of the sensor from the movable part (T).

4,589,039

PINCH ROLLER ACTUATOR FOR TAPE RECORDER

Masanori Sugihara, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Sep. 1, 1982, Ser. No. 413,845
Claims priority, application Japan, Sep. 2, 1981, 56-130480[U]
Int. Cl.[4] G11B *5/008, 15/00, 17/00*
U.S. Cl. 360—90 **4 Claims**



1. A pinch roller actuator for use in a tape recorder, comprising, a chassis, a capstan rotatably mounted on said chassis, a pinch roller holder pivotably mounted on said chassis, a play arm pivotably mounted on said chassis and movable in coaction with a mode changeover means of the tape recorder, said pinch roller holder having a pinch roller at one end thereof and a cam face at the other end thereof, said play arm having an integral pin confronting said cam face, and torsion spring means for urging said cam face in a first rotational direction into sliding contact with said pin, and engaging an integral part of said play arm for causing said pinch roller holder to rotate in said first rotational directional concurrently with the rotation of said play arm in a second rotational direction whereby pivoting of said play arm causes displacement of said pin to pivot said pinch roller holder such that said pinch roller engages and disengages said capstan.

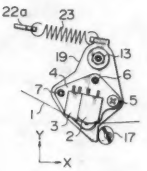
4,589,040

MAGNETIC HEAD POSITION ADJUSTING MECHANISM

Hideyuki Kawase, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 17, 1983, Ser. No. 476,270
Claims priority, application Japan, Mar. 19, 1982, 57-42713
Int. Cl.[4] G11B *5/56*
U.S. Cl. 360—109 **10 Claims**

1. A magnetic head adjusting device comprising: a head base plate carrying magnetic heads and having a shaft bore; a support shaft mounted on a chassis and fitted in said shaft bore in said head base plate; means for applying a force to said head base plate for rotating said head base plate about said support shaft; and a tapered adjusting means including a member having a conical outer peripheral surface adapted to contact one end of said head base plate so as to limit the rotation of said head base plate about said support shaft, and a shaft along



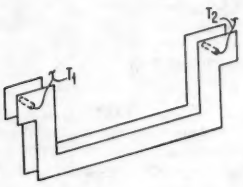
which said member moves up or down; wherein said tapered adjusting means is mounted on said chassis in such a manner that a generating line of said conical outer peripheral surface which includes the point of contact between said conical outer peripheral surface and said head base plate extends substantially in parallel with said support shaft.

4,589,041

DIFFERENTIAL MAGNETORESISTIVE SENSOR FOR VERTICAL RECORDING

Otto Voegeli, Morgan Hill, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 30, 1982, Ser. No. 412,656
Int. Cl.[4] G11B *5/127, 5/33;* **G01R** *33/02;* **G11C** *19/08*
U.S. Cl. 360—113 **8 Claims**



1. A sensor for reading binary data stored on a magnetic surface in the form of recorded flux field transitions comprising:

a pair of thin film mutually-biased magnetoresistive strips, corresponding ends of which are interconnected to define first and second terminals, one of which is adapted to be connected to a constant current source, said strips being spaced apart in parallel relationship so that a substantially different field is sensed by each of said strips, said strips having substantially the same resistance value R, whereby the magnetoresistive strips are connected such that the current I supplied from said source splits substantially equally between said strips to cause said strips to be biased in opposite directions and at the same corresponding point in the linear region of the respective magnetoresistive curves for said strips; and

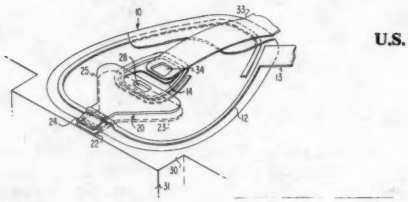
means for obtaining an output signal V from said sensor in response to each said strip sensing magnetic flux components that have been stored on a magnetic surface and that are substantially parallel to the respective bias fields, said signal V being (1) constant when said flux components are in the same direction and of substantially the same value which results in a zero net change in the effective resistance between said terminals, and (2) variable in proportion to the algebraic difference in the respective values of said flux components to produce a unimodal signal.

4,589,042

COMPOSITE THIN FILM TRANSDUCER HEAD

Nathaniel C. Anderson, Pine Island, Minn., and Robert E. Jones, Jr., San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 27, 1983, Ser. No. 508,207
Int. Cl.[4] G11B *5/12, 5/22, 5/20*
U.S. Cl. 360—125 **7 Claims**



1. In a composite film magnetic transducer head including a yoke with two layers of magnetic material having physical contact at a back gap region to provide a continuous path of magnetic material between a pair of pole tips that form the transducing gap and a series of electrically insulated conductor windings extending through said yoke between said magnetic material layers, the improvement comprising:

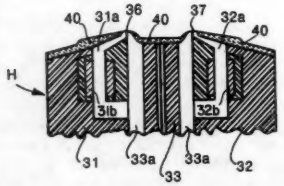
pole tips of said yoke being formed of a high saturation magnetization alloy extending the transducer gap to a location beyond the point of initial saturation and the balance of said layers of material forming said yoke being formed of high permeability material with the pole tip portions being in intimate contact with the high permeability yoke material to form said continuous path of magnetic material from one side of said transducing gap to the other side of said transducing gap.

4,589,043

MAGNETIC HEAD HAVING A THERMOPLASTIC OR A THERMOSETTING PLASTIC HOUSING

Matthias J. Grundtner, 2933 Troseth Rd., St. Paul, Minn. 55113

Filed Aug. 31, 1982, Ser. No. 413,546
Int. Cl.[4] G11B *5/147, 5/127, 5/187;* H01F *7/06*
U.S. Cl. 360—126 **13 Claims**



1. A magnetic head unit for computer equipment comprising,

a body forming a magnetic transducer housing made from a thermoplastic or a thermosetting plastic material capable of being formed into the desired shape and dimensions and having a deflection temperature property according to ASTM standards of more than 400° F., and having

magnetic transducer components mounted in said body and including core gaps which perform magnetic read-write functions said body including tape-engaging surfaces adjacent to the magnetic core gap components,

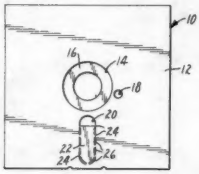
a coating of wear-resistant material bonded to the tape-engaging surface to produce the desired wear resistance and mechanical stability to the tape-engaging surface and upper head portion required for such a magnetic head.

4,589,044

HEAD-CLEANING DISKETTE HAVING JACKET WITH REMOVABLE TAB

Terrance D. Lindberg, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Apr. 19, 1983, Ser. No. 486,404
Int. Cl.[4] G11B *23/02, 5/41*
U.S. Cl. 360—128 **4 Claims**



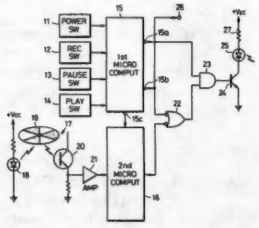
1. A head-cleaning diskette comprising a revolvable fibrous cleaning disc, and a jacket having first and second panels disposed on opposite side surfaces of said disc and having central openings affording access to said fibrous cleaning disc, said first panel having spaced open through slots wider in the plane of said panel than the thickness of said panel and defining a tear-out tab disposed radially of said disc and being supported in the plane of said first panel by wedge-shaped tangs between said slots, the wider ends of said tangs being attached to and facing into said tear-out tab and the narrow ends of said tangs facing out of and being opposite the tear-out tab so that removal of the tear-out tab will cause separation of the tangs from the rest of said first panel at said narrow ends leaving few segments of the tangs that can shed and be pulled away onto the surface of the cleaning disc when it is revolved to clean a head.

4,589,045

STATE INDICATOR DEVICE FOR INDICATING STATES OF RECORDING AND TAPE

Tsuneyuki Koyama, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed May 19, 1983, Ser. No. 496,128
Claims priority, application Japan, May 21, 1982, 57/85708
Int. Cl.[4] G11B *15/00*
U.S. Cl. 360—137 **9 Claims**



1. A state indicator device in a recording and/or reproducing apparatus having a recording manipulation switch and tape driving means for causing a tape to travel, said state indicator device comprising:

detecting means for detecting tape travel and producing a detection output;

tape traveling signal generating means for producing a tape

traveling signal having a repetition frequency which is in accordance with the detection output of said detecting means;

recording mode signal generating means for generating a recording mode signal immediately when said recording manipulation switch is turned ON:

mute control signal generating means for generating a mute control signal in response to the ON state of said recording manipulation switch, said mute control signal causing a mute mode to be ON so as to mute a recording signal for a predetermine dtime period within which the traveling speed of the tape which is caused to travel by said tape driving means in a predetermined tape path reaches a predetermined tape travel speed, and causing the mute mode to be OFF so as to cancel the muting of the recording signal when said predetermined time period elapses and record the recording signal onto the tape by use of heads;

a logic circuit supplied with the tape traveling signal from said tape traveling signal generating means, the recording mode signal from said recording mode signal generating means, and the mute control signal from said mute control signal generating means, for producing a first driving signal for causing continuous emission of light when said recording mode signal exists and said mute control signal is in a signal state for causing the mute mode to be ON, and producing a second driving signal in accordance with said tape traveling signal when said recording mode signal exists and said mute control signal is in a signal state for causing the mute mode to be OFF; and

a single visual indicator element for continuously emitting light in response to the output first driving signal of said logic circuit so as to indicate a state in which said recording manipulation switch is turned ON but the recording signal is muted, said single visual indicator element blinking at the repetition frequency of said tape traveling signal in response to the output second driving signal of said logic circuit so as to indicate a state in which a recording operation is carried out with the tape traveling at said predetermined tape travel speed.

4,589,046

APPARATUS FOR DETECTING GROUND FAULT IN VARIABLE-VOLTAGE VARIABLE-FREQUENCY POWER SYSTEM

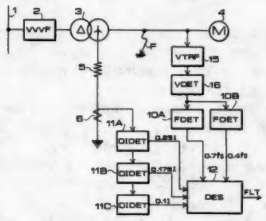
Nobuharu Takata, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 22, 1984, Ser. No. 592,440

Claims priority, application Japan, Mar. 23, 1983, 58-49740; Mar. 23, 1983, 58-49742

Int. Cl.⁴ H02H *3/16*

U.S. Cl. 361—42 **6 Claims**



1. An apparatus for detecting a ground fault in a power system which supplies an electric power to a load while maintaining the frequency-to-voltage ratio of said electric power at a predetermined value, said apparatus comprising: a plurality of current detecting means having respective threshold values for current detection and receiving a zero phase sequence current of said power system introduced thereto;

a plurality of frequency detecting means having respective threshold values for frequency detection and receiving a voltage related to the frequency of the electric power to be supplied to said load; and

logical means for discriminating the states of the output signals from said current and frequency detecting means in accordance with predetermined logical conditions and, when said conditions are satisfied, producing a signal representative of occurrence of a ground fault in said power system.

4,589,047

PROTECTIVE MECHANISM IN ELECTRICALLY OPERATED DEVICES

Harry Gaüs, Schwanheimerstr. 93, Bensheim, Fed. Rep. of Germany (D-6140), and Hagen Gross, Am Zollstock 29, Bad Homburg, Fed. Rep. of Germany (D-6380)

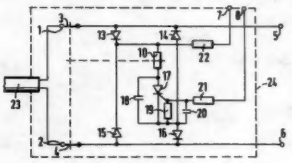
PCT No. PCT/EP83/00062, § 371 Date Nov. 7, 1983, § 102(e) Date Nov. 7, 1983, PCT Pub. No. WO83/03160, PCT Pub. Date Sep. 15, 1983

PCT Filed Mar. 4, 1983, Ser. No. 557,153

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1982, 3208147; Sep. 24, 1982, 3235366

Int. Cl.⁴ H02H *5/04*

U.S. Cl. 361—42 **19 Claims**



1. A hazard prevention device for an electrical externally powered apparatus comprising:

a housing, said housing having at least one opening and said housing comprising an electrical operating unit and a pair of spaced-apart electrically exposed electrically conductive probe networks, said pair being responsive to the entry of a conductive fluid electrically reducing the impedance between said probe networks of said pair;

electrical source lines comprising at least one nonground electrical source line;

a thermally actuated normally closed disconnect switch comprising at least one pair of normally closed contacts and an electrically conductive member, each said pair of normally closed contacts having a first contact and a second contact, said first contact being electrically connected to an electrical source line connection, said second contact connected to an electrical connection of said apparatus, each said pair of contacts being normally electrically closed in cooperation with said electrically conductive member, said member having two ends, one of said ends electrically connected to a nonground electrical source line of said electrical source lines, with at least each and every said first contact of each said pair of contacts which is associated with a respective nonground electrical source line being connected to its respective associated nonground electrical source line, with said thermally actuated normally closed disconnect switch operating so that upon electrical activity between said ends of said member through said member, termination of electrical conductivity between each and every said pair of normally closed contacts will occur;

a trigger circuit comprising a semiconductor switch, said semiconductor switch having a first terminal, a second terminal, and a gate input, said gate input being excited only upon low impedance between said probe networks of said pair of probe networks, said semiconductor switch

being electrically conductive between said first terminal and said second terminal only upon said gate input excitation;

wherein entry of conductive fluid into said housing reduces said impedance between said probe networks of said pair causing said gate input excitation, which in turn causes said semiconductor switch to conduct between said first and second terminals, thereby providing electrical activity through said member causing said member to lose its ability to keep the normally-closed mechanical bias and associated electrical conductivity between said first contact and said second contact of each and every said pair of contacts, which in turn causes termination of electrical activity between said each said pair of normally closed contacts of said thermally actuated normally-closed disconnect switch, thus preventing injury to living species.

4,589,048

APPARATUS FOR DETECTING GROUND FAULT IN VARIABLE-VOLTAGE VARIABLE-FREQUENCY POWER SYSTEM

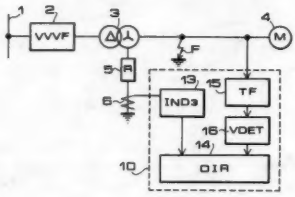
Nobuharu Takata, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 17, 1984, Ser. No. 571,656

Claims priority, application Japan, Mar. 23, 1983, 58-49737; Mar. 23, 1983, 58-49738; Mar. 23, 1983, 58-49739; Mar. 23, 1983, 58-43218

Int. Cl.⁴ H02H *3/16*

U.S. Cl. 361—42 **4 Claims**



1. An apparatus for detecting a ground fault in a power system which is fed with a variable-voltage, variable-frequency power source controlled in such manner that the output voltage of said power source is nearly proportional to its output frequency, said apparatus comprising:

input means for producing a signal proportional to a zero phase sequence voltage or current of said power system;

modifying means for obtaining an operation signal inversely proportional to the frequency of said power system from the signal of said input means; and

relay means activated when the signal of said modifying means is beyond a predetermined level.

4,589,049

PROTECTION CIRCUIT FOR INTEGRATED CIRCUITS

Gerhard Krumrein, Neuenstadt, Fed. Rep. of Germany, assignor to TELEFUNKEN electronic GmbH, Heilbronn, Fed. Rep. of Germany

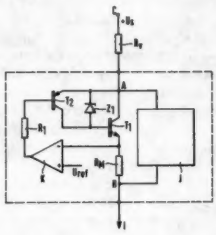
Filed Oct. 12, 1984, Ser. No. 660,314

Claims priority, application Fed. Rep. of Germany, Oct. 20, 1983, 3338124

Int. Cl.⁴ H02H *9/00*

U.S. Cl. 361—56 **7 Claims**

1. A protection circuit for an integrated circuit, in particular, for integrated circuits for motor vehicles, said circuit comprising a first transistor having a collector, base, and emitter, a second transistor having a collector, base, and emitter, a comparator, a measuring resistor preceding the emitter of the first transistor, and means for causing the first transistor to conduct when the protection circuit is exposed to a predetermined voltage, wherein the voltage dropping at the measuring resistor is compared to a reference voltage by means of the comparator, wherein the output signal of the comparator drives the



base of the second transistor, wherein the base of the first transistor is connected to the collector of the second transistor, and wherein the collector of the first transistor is connected to the emitter of the second transistor.

4,589,050

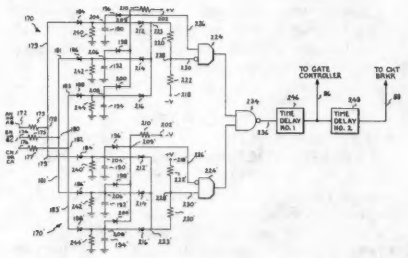
METHOD AND APPARATUS FOR THE PROTECTION OF A THYRISTOR POWER CONVERSION SYSTEM

John H. Cutler, Roanoke, and Loyal N. Stallard, Daleville, both of Va., assignors to General Electric Company, Salem, Va.

Continuation-in-part of Ser. No. 467,303, Feb. 17, 1983, abandoned. This application Jan. 7, 1985, Ser. No. 689,418

Int. Cl.⁴ H02H *3/26*

U.S. Cl. 361—86 **49 Claims**



1. A method which detects faults in a thyristor power converter coupled to and receiving power from a polyphase alternating current source by means of a plurality of power line conductors, comprising the steps of:

(a) half-wave rectifying both the positive and negative portions of each phase voltage supplied to said converter from said source to provide, respectively, positive and negative rectified voltages;

(b) determining the largest amplitude and the smallest amplitude of said positive rectified voltages and developing signals representative thereof;

(c) determining the largest amplitude and the smallest amplitude of said negative rectified voltages and developing signals representative thereof;

(d) utilizing signals developed from both the positive and negative rectified voltages to perform at least one comparison between a signal representative of a largest amplitude voltage and a signal representative of a smallest amplitude voltage to develop a signal indicative of the difference therebetween;

(e) generating a fault indicating signal whenever said difference exceeds a predetermined limit; and

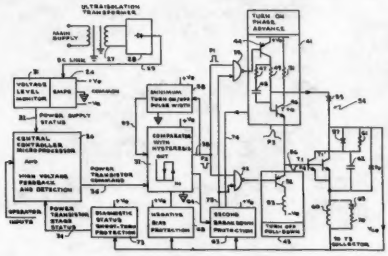
(f) initiating a predetermined protective action in response to said fault indicating signal.

4,589,051

SECOND BREAKDOWN PROTECTION CIRCUIT FOR X-RAY GENERATOR INVERTER

Carlos M. Santurtûn; Felix L. Ceca, and José M. Q. Benegoechea, all of Madrid, Spain, assignors to General Electric Company, Milwaukee, Wis.

Filed Dec. 22, 1983, Ser. No. 564,539
Int. Cl.[4] H02H 3/20
U.S. Cl. 361—88 2 Claims



2. An X-ray generator system for use with a DC voltage source and a high voltage transformer to supply a controlled level of high voltage to an X-ray tube comprising:

(a) an inverter for receiving a DC voltage of a lower level and delivering an AC voltage output to the primary of the high voltage transformer, said inverter comprising a plurality of switching devices which are selectively turned on and off in a predetermined sequence by a control system;

(b) rectifier means for receiving the output from the secondary coil of said transformer and for delivering a DC voltage of a higher level to an X-ray tube;

(c) means for sensing the voltage on at least one of said switching devices, said sensing means including a diode with its cathode connected to said switching device and its anode connected to the positive terminal of a comparator and to a positive DC voltage source with the negative terminal of the comparator connected to a reference voltage source; and

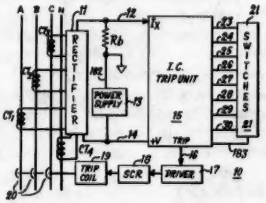
(d) means for turning off said switching device when said voltage reaches a predetermined threshold level.

4,589,052

DIGITAL I^2T PICKUP, TIME BANDS AND TIMING CONTROL CIRCUITS FOR STATIC TRIP CIRCUIT BREAKERS

John J. Dougherty, Avon, Conn., assignor to General Electric Company, New York, N.Y.

Filed Jul. 17, 1984, Ser. No. 631,708
Int. Cl.[4] H02H 7/00
U.S. Cl. 361—94 48 Claims



1. A static trip circuit interrupter comprising:

a pair of electrical contacts;

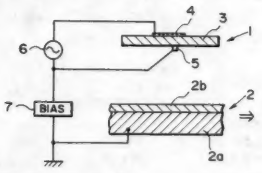
current sensing means for sensing current within a protected circuit; A/D conversion means for providing a digital output signal representation of said sensed current; interrupter means connected with said current sensing means for operating said electrical contacts; multiple digital comparison means connected with said interrupter means for providing a control signal to said interrupter means to separate said contacts upon occurrence of a sensed current in excess of first or second predetermined overcurrent values which persist longer than first or second predetermined time delay values; and input means connected with said digital comparison means for providing said first and second pre-determined overcurrent and time delay values to said multiple digital comparison means; wherein said A/D conversion means comprises a comparator for comparing said sensed current to a reference value, the output of said comparator then being multiplied by a first fixed frequency clock pulse within a first logic gate.

4,589,053

METHOD AND DEVICE FOR CHARGING OR DISCHARGING A MEMBER

Nagao Hosono, Hachiohji; Yukio Nagase; Tatsuo Takeuchi, both of Tokyo; Hidemi Egami, Zama, and Hiroshi Satomura, Hatogaya, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 7, 1984, Ser. No. 618,248
Int. Cl.[4] H05F 3/04
U.S. Cl. 361—213 16 Claims



1. A method of charging or discharging a member comprising the steps of:

opposing a discharging member to a member to be acted on, said discharging member having a dielectric member, and having an inducing electrode and a discharging electrode sandwiching the dielectric member so that the discnarging electrode faces the member to be acted on, wherein the discharging electrode extends on a surface of the dielectric member parallel to a center line of the inducing electrode at such a position that the discharging electrode is spaced away from one lateral end of the inducing electrode by a smaller distance than from the other lateral end of the inducing electrode;

applying an alternating voltage between the inducing electrode and the discharging electrode to product a surface discharge area on a surface of the dielectric member at the discharging electrode side, wherein one of the lateral ends of the surface discharge area is substantially coincident with said one of the lateral ends of the inducing electrode; and

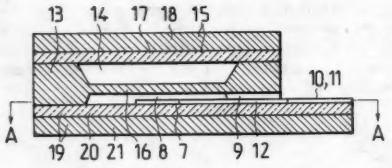
moving the member to be acted on relative to the discharging electrode to charge or discharge the member to be acted on by the thus formed surface discharge.

4,589,054

CAPACITIVE PRESSURE DETECTOR INDEPENDENT OF TEMPERATURE

Heikki T. Kuisma, Helsinki, Finland, assignor to Vaisala Oy, Helsinki, Finland

Filed Feb. 15, 1985, Ser. No. 701,864
Claims priority, application Finland, Feb. 21, 1984, 840701
Int. Cl.[4] H01G *7/00*; G01L *9/12*
U.S. Cl. 361—283 **7 Claims**



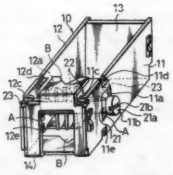
1. A capacitive pressure detector, which comprises
a support plate,
a stationary capacitor plate disposed on the support plate, and
a silicon plate disposed on the support plate so that it surrounds the stationary capacitor plate and having a thin middle portion forming a membrane-like structure acting as a mobile capacitor plate and the bottom of a vacuum capsule, wherein
the support plate consists of a silicon layer and of a glass layer attached onto said silicon layer and placed against the silicon plate, said glass layer being essentially thinner than the silicon layer so that in the combined support plate, owing to the elasticity coefficients and thermal expansion coefficients of the different layers, the difference in thermal expansion between the combined support plate and the silicon membrane is essentially reduced.

4,589,055

ROTOR SHAFT SUPPORT MECHANISM IN OSCILLATOR

Shigeru Nigorikawa, Kakuda, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Feb. 1, 1985, Ser. No. 697,286
Claims priority, application Japan, Feb. 2, 1984, 59-13444
Int. Cl.[4] H01G *5/06*
U.S. Cl. 361—298 **5 Claims**



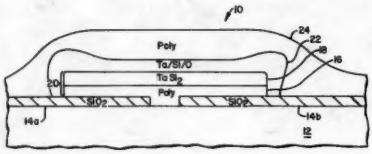
1. In an oscillator comprising a frame, a variable capacitor mounted in said frame and having a rotor and a stator, said rotor having a rotor shaft rotatably supported on said frame, a rotor shaft support mechanism comprising:
two sets of rotor shaft support means provided in said frame, one of said two sets of rotor support means being adapted to support said rotor shaft in one direction, the other one of said rotor shaft support means being adapted to support said rotor shaft in the other direction which is not parallel to said one direction, said rotor shaft being supported by a selected one of said two sets of rotor support means so that said rotor shaft extends in a selected one of said one and the other directions; and
spring means for urging said rotor shaft against said selected one of said two sets of rotor shaft support means.

4,589,056

TANTALUM SILICIDE CAPACITOR

James B. Stimmell, Sunnyvale, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Oct. 15, 1984, Ser. No. 660,991
Int. Cl.[4] H01G *4/06, 9/00, 7/00*
U.S. Cl. 361—311 **7 Claims**



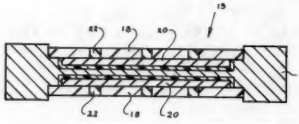
1. A capacitor for an integrated circuit comprising:
a first electrically conductive layer composed of a silicide bearing material;
a dielectric layer disposed over said first electrically conductive layer, said dielectric layer including oxides of said silicide components whereby said dielectric layer comprises a compound of metal, silicon and oxygen; and
a second electrically conductive layer disposed over said dielectric layer.

4,589,057

COOLING AND POWER AND/OR GROUND DISTRIBUTION SYSTEM FOR INTEGRATED CIRCUITS

W. Harry Short, Mesa, Ariz., assignor to Rogers Corporation, Rogers, Conn.

Filed Jul. 23, 1984, Ser. No. 633,589
Int. Cl.[4] H05K *7/20*
U.S. Cl. 361—386 **18 Claims**



9. A cooling and power and/or ground distribution system for printed wiring elements having at least one electronic component thereon comprising:
thermally conductive metal plate means, said plate means having two opposed side surfaces;
discreet power and/or ground distribution buss bar means being attached to at least one of said opposed sides of said plate means, but being electrically insulated therefrom;
thermally conductive elastomeric material being attached to at least a portion of at least one opposed side of said plate means, and thermally conductive elastomeric material being selectively disposed over at least a first portion of said discreet buss bar means;
electrically conductive elastomeric material being selectively disposed over at least a second portion of said discreet buss bar means and being mechanically and electrically attached thereto;
said electrically conductive elastomeric material defining a plurality of distinct elements, said distinct elements being

separated from each other by said thermally conductive elastomeric material;

said discreet buss bar means being sandwiched between said conductive metal plate means and said thermally and electrically conductive elastomeric materials, said discreet buss bar means being fully surrounded by said plate means and said elastomeric materials;

at least one printed wiring element having at least one electronic component thereon, said printed wiring element being removably attached to at least one opposed side of said plate means; and

said plate means including means for effecting said removable attachment of said printed wiring element thereto.

4,589,058

ELECTROLYTIC CAPACITOR

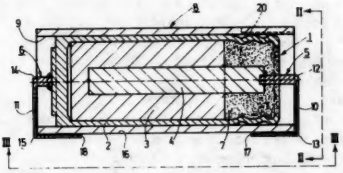
Hans Peternell, and Rudolf Schnapauff, both of Klagenfurt, Austria, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 3, 1983, Ser. No. 519,877

Claims priority, application Austria, Nov. 12, 1982, 4136/82

Int. Cl.[4] H01G *9/00*

U.S. Cl. 361—433 **1 Claim**



1. Electrolytic capacitor provided with an electrically conductive cylindrical cup with two end faces from which two coaxial connection wires extend, characterized in that said cup is surrounded by a prismatic casing consisting of an insulating material, which prismatic casing is provided with a continuous cylindrical recess, that each of said connection wires projects from each end of said casing and that said connection wires projecting from said casing are strip shaped and bent over to lie along the same side surface of said casing, the ends of said strips being situated at a distance from each other.

4,589,059

METHOD OF STARTING A CURRENT-FED INVERTER WITH SELF-EXCITATION

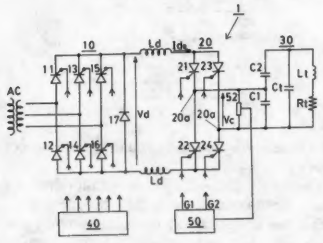
Morihiko Tanino, Yokahama, Japan, assignor to Neturen Co., Ltd., Tokyo, Japan

Filed Mar. 22, 1984, Ser. No. 593,249

Claims priority, application Japan, May 31, 1983, 58-94846

Int. Cl.[4] H02M *5/458*

U.S. Cl. 363—49 **3 Claims**



1. A method of starting a current-fed inverter with self-excitation for supplying AC power to an inverter load having a DC cut-off capacitor, the current-fed inverter having a power inverter unit composed of a plurality of thyristors and having AC output terminals, said starting method comprising the steps of:

(a) applying successive gate pulses to a pair of the plurality of thyristors from a time when a starting signal is generated at least until a turn-on current for the pair of thyristors exceeds a latching current;

(b) detecting a voltage between the AC output terminals and comparing the detected voltage with a preset voltage corresponding to a thyristor reverse-biasing voltage;

(c) generating a pulse each time the detected and preset voltages are equal to each other; and

(d) supplying gate pulses in synchronism with the generated pulses to the thyristors of the power inverter unit in a prescribed order until a period of oscillation of the gate pulses is equal to a predetermined inverter oscillation period.

4,589,060

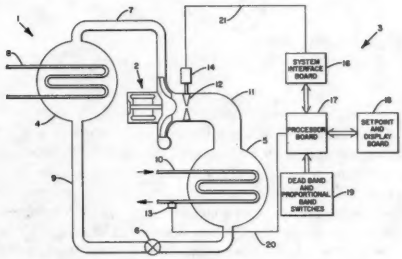
MICROCOMPUTER SYSTEM FOR CONTROLLING THE CAPACITY OF A REFRIGERATION SYSTEM

Thomas M. Zinsmeyer, Pennellville, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed May 14, 1984, Ser. No. 610,062

Int. Cl.[4] G06F *15/46*; F25D *17/02*

U.S. Cl. 364—148 **8 Claims**



1. A method of operating a refrigeration system having a microcomputer system for controlling the capacity of the refrigeration system, which comprises the steps of:

generating a first signal indicative of a selected capacity control response factor;

generating a second signal indicative of a selected set point temperature for a heat transfer fluid cooled by operation of the refrigeration system;

sensing the temperature of the heat transfer fluid cooled by operation of the refrigeration system and generating a third signal indicative of this sensed temperature;

generating a fourth signal indicative of an upper limit of a selected temperature deadband relative to the selected set point temperature;

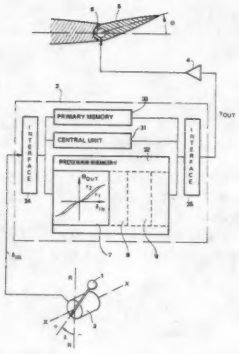
processing the first, second, third, and fourth signals to determine the relative temperature difference between the sensed temperature and the selected set point temperature and, when the sensed temperature is determined to be greater than the selected set point temperature by an amount which exceeds the upper limit of the selected temperature deadband, to generate a control signal which is a step function of the determined relative temperature difference between the sensed temperature and the selected set point temperature, with the width of each step being directly proportional to the selected capacity control response factor; and

adjusting the capacity of the refrigeration system in response to the generated control signal.

4,589,061
METHOD OF VARYING RESPONSE FINENESS IN A CONTROL SYSTEM

Lennart Nordström, Linköping, Sweden, assignor to Saab-Scania Aktiebolag, Linköping, Sweden

Filed Apr. 18, 1984, Ser. No. 601,644
Claims priority, application Sweden, Apr. 18, 1983, 8302136
Int. Cl.[4] G05B *13/02*
U.S. Cl. 364—157 6 Claims



3. A method of controlling response fineness in a control system comprising a manipulated unit that is displaceable from and toward a null position in increase and decrease directions respectively, and a controlled device that is actuated respectively from and toward a neutral position in response to displacements of said unit, wherein an input is generated that has a magnitude which at each instant designates the existing position of displacement of said unit from its null position and an output is produced that has a magnitude which at each instant signifies the position that the controlled device is to have and which is related to the existing magnitude of the input, said method being characterized by:

A. when said unit is in a predetermined range of its positions of displacement, and during every displacement of said unit through no more than a predetermined distance in each said direction that next follows a displacement of said unit in the opposite direction, varying said magnitude of the output in accordance with a first gain relationship between input and output magnitudes;

B. when said unit is in said range of positions, and during every displacement of said unit in the increase direction other than as aforesaid, increasing said magnitude of the output in accordance with a second gain relationship between input and output magnitudes having a substantially higher gradient than said first gain relationship; and

C. when said unit is in said range of positions, and during every displacement of said unit in the decrease direction other than as aforesaid, decreasing said magnitude of the output in according with a third gain relationship

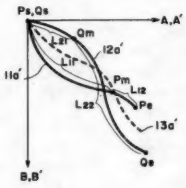
(1) which has a gradient on the order of that of said second gain relationship but

(2) wherein the output magnitude related to each position of displacement of said unit signifies a greater displacement of the controlled device from its neutral position than the output magnitude of the second gain relationship that is related to the same position of said unit.

4,589,062
METHOD OF CREATING CURVED SURFACES

Hajimu Kishi, Hino, and Masaki Seki, Tokyo, both of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

PCT No. PCT/JP82/00114, § 371 Date Dec. 7, 1982, § 102(e) Date Dec. 7, 1982, PCT Pub. No. WO82/03705, PCT Pub. Date Oct. 28, 1982
PCT Filed Apr. 9, 1982, Ser. No. 451,162
Claims priority, application Japan, Apr. 10, 1981, 56-054044
Int. Cl.[4] G05B *19/415*
U.S. Cl. 364—168 3 Claims



1. A method of creating a curved surface on a workpiece using a computer, by moving and transforming a first section curve of two given section curves until the first section curve is superposed on a second section curve, said method comprising the steps of:

(a) defining, on the first section curve, a first correspondence point which corresponds to a second correspondence point on the second section curve;

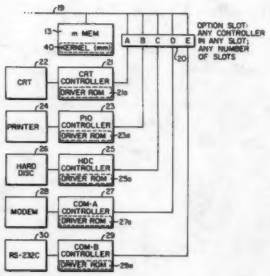
(b) generating intermediate section curves in accordance with the first and second correspondence points; and

(c) machining the workpiece along the intermediate section curves to form the curved surface.

4,589,063
DATA PROCESSING SYSTEM HAVING AUTOMATIC CONFIGURATION

Bakul V. Shah, and James A. Maskevitch, both of Palo Alto, Calif., assignors to Fortune Systems Corporation, San Carlos, Calif.

Filed Aug. 4, 1983, Ser. No. 520,354
Int. Cl.[4] G06F *3/00*
U.S. Cl. 364—200 13 Claims



1. Apparatus for data processing system autoconfiguration, comprising:

a system motherboard, including a plurality of data processing system pollable peripheral device slots;

at least one device driver module resident on an I/O board, for connecting an associated selected peripheral device to said data processing system via a corresponding motherboard slot and for controlling said peripheral device in accordance with data processing system operation;

an identifying header, prefatory to said device driver module and responsive to data processing system peripheral device slot polling to uniquely identify an associated peripheral device to said data processing system; and

a data processing system-resident peripheral device table for collating polled peripheral device identity and for establishing a bidirectional information transfer link between said data processing system and said device driver module, whereby said data processing system is automatically configured for coordinated operation with said peripheral device.

4,589,064

SYSTEM FOR CONTROLLING KEY STORAGE UNIT WHICH CONTROLS ACCESS TO MAIN STORAGE

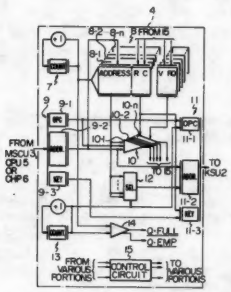
Takashi Chiba; Satoru Koga, both of Kawasaki, and Minji Senda, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

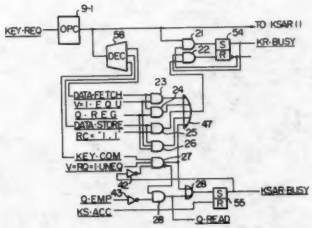
Filed Feb. 25, 1983, Ser. No. 469,817

Claims priority, application Japan, Feb. 27, 1982, 57-31201; Feb. 27, 1982, 57-31326

Int. Cl.[4] G06F *9/00*

U.S. Cl. 364—200 **8 Claims**





1. A system for controlling a key storage unit in a data processing apparatus, comprising:

a main storage unit having at least one block;

a key storage unit for storing a main storage protection key, at least one reference bit, and at least one change bit for each block of said main storage unit;

a processing unit, said processing unit producing at least one access request for said main storage unit;

a main storage control unit, operatively connected to said main storage unit and said processing unit, for processing the access request for said main storage unit and producing a key storage access request for said key storage unit, said key storage access request having address data and requesting a change in the reference bit and the change bit in said key storage unit, the reference bit and the change bit corresponding to the accessed block of said main storage, said main storage control unit supplying said key storage access request for said key storage unit every time said main storage control unit accesses said main storage unit in response to the access request for said main storage unit supplied from said processing unit;

a key storage control unit, operatively connected to said processing unit and said main storage control unit, for controlling access to said key storage unit, comprising:

a key queue, operatively connected to said main storage control unit and said key storage unit, for temporarily holding a plurality of said key storage access requests supplied from said main storage control unit, said key storage control unit registering each of said key storage access requests supplied from said main storage control unit into said key queue in order, and said key storage control unit, independent of the above-mentioned registering process, reading and processing each of said key storage access requests registered in said key queue in order;

comparing means, operatively connected to said key queue and said main storage control unit, for comparing the content of said key storage access request supplied from said main storage control unit with the content of each key storage access request registered in said key queue; and

inhibiting means, operatively connected to said comparing means and said key queue, for inhibiting said key storage access request supplied from said main storage control unit from being registered in said key queue when the content of said key storage access request supplied from said main storage control unit is equal to the content of one of said key storage access requests registered in said key queue.

4,589,065

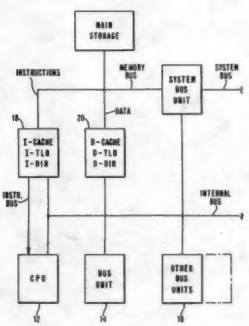
MECHANISM FOR IMPLEMENTING ONE MACHINE CYCLE EXECUTABLE TRAP INSTRUCTIONS IN A PRIMITIVE INSTRUCTION SET COMPUTING SYSTEM

Marc A. Auslander, Millwood; John Cocke, Bedford; Hsieh T. Hao, Chappaqua; Peter W. Markstein, Yorktown Heights, and George Radin, Piermont, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1983, Ser. No. 509,733

Int. Cl.[4] G06F *9/00*

U.S. Cl. 364—200 **7 Claims**



1. In a digital electronic computing system having a single machine cycle executable instruction set and including a memory hierarchy comprising a main memory and a high-speed cache, a Central Processing Unit (CPU) and a bus network interconnecting same, said CPU including an arithmetic and logic unit (ALU) for performing mathematical and logical operations on data supplied thereto, an instruction unit operable in cooperation with a plurality of simultaneously accessible

general purpose registers and said ALU for processing primitive instructions to be performed by said system, and condition code generating means for generating a plurality of specified condition bits in accordance with the output of the ALU and the instruction unit including at least less than, greater than, and equal to indicator bits as a result of a 'compare' operation in the ALU on two specified operands, the improvement which comprises:

a mechanism for performing a one cycle trap instruction in said CPU including means for directing the ALU to perform a compare operation between two operands specified by said instruction,

means for directly testing the output of said condition code generation means to determine if a specified one of said comparison bits has been set,

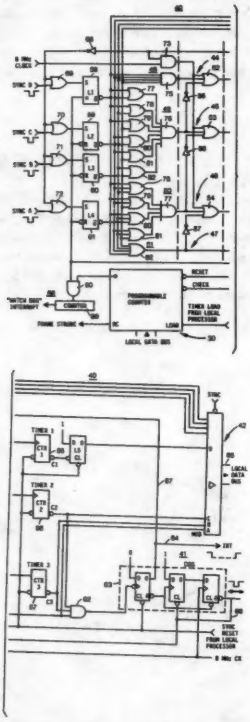
means operable upon an affirmative indica-tion by said last named means to cause a 'trap' interrupt to be taken.

4,589,066

FAULT TOLERANT, FRAME SYNCHRONIZATION FOR MULTIPLE PROCESSOR SYSTEMS

Jack F. Lam, Endwell, and Hermann Schmid, Binghamton, both of N.Y., assignors to General Electric Company, Binghamton, N.Y.

Filed May 31, 1984, Ser. No. 615,965
Int. Cl.[4] G06F *1/04, 11/20*
U.S. Cl. 364—200 **8 Claims**



1. In a multiprocessor system synchronized at specific repetitive processor computational time frame periods, the combination of:

(a) a plurality of processors, only a portion of which perform computational activities at a given time,

(b) means associated with each processor for generating a synchronizing pulse at the end of each processor minor frame period, and transmitting said pulse over existing interprocessor communication lines to its own and all other processors,

(c) synchronizing means for each processor for receiving pulses from its own and all other processor synchronizing pulse means and selecting a lesser portion (N) of said received pulses for use in synchronization,

(d) synchronizing pulse logic circuitry associated with each synchronizing means for determining whether a majority of the selected synchronizing pulses are received within a predetermined time interval, including means to determine the selected arrival of each one of the selected synchronizing pulses within said interval,

(e) means coupled to each of the said synchronizing pulse logic circuitry for storing error status information about each of the selected synchronizing pulses,

(f) means for generating a control signal in response to the state of the synchronizing pulse logic circuitry if all of the selected synchronizing pulses arrive within the predetermined interval and if more than one of the selected synchronizing pulses fails to arrive within said interval,

(g) means for coupling said control signal to its own processor to initiate a supervisory software routine which:

(1) interrogates said storage means for the arrival status of the selected synchronizing pulses,

(2) identifies any failed selected synchronizing pulse, or pulses and the processor associated therewith

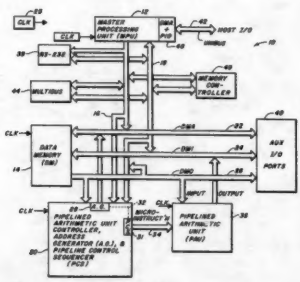
(3) replaces out of synchronism processors.

4,589,067

FULL FLOATING POINT VECTOR PROCESSOR WITH DYNAMICALLY CONFIGURABLE MULTIFUNCTION PIPELINED ALU

John B. Porter, Lexington; David W. Altmann, Marblehead; Bruno A. Mattedi, Andover, and Ralph Jones, Waltham, all of Mass., assignors to Analogic Corporation, Peabody, Mass.

Filed May 27, 1983, Ser. No. 498,877
Int. Cl.[4] G06F *15/16, 9/38, 7/49, 7/38*
U.S. Cl. 364—200 **35 Claims**



1. A full floating point vector processor, comprising:

a master procesing unit;

first means coupled to said master processing unit and having an input and an output bus for providing a plurality of addressable memory locations;

second means coupled to said first means and to said master processing unit for loading data to be evaluated in said addressable memory locations;

third means coupled to said first means and to said master processing unit and operative concurrently with said master processing unit for providing a plurality of time sequential memory read and write addresses, and for providing a selectively delayed control signal;

said first means are operable in response to individual ones of said plurality of time sequential memory read addresses to provide the corresponding data loaded at individual ones

of said memory read addresses on said output bus and operable in response to individual ones of data memory write addresses to load the corresponding data on said input bus to said write memory address;

fourth means coupled to said first means, to said third means, and to said master processing unit and operative concurrently with both said master processing unit and said third means in response to said delayed control signal for providing a plurality of time sequential microinstructions in time-synchronization with corresponding ones of said plurality of time sequential memory read and write addresses; and

fifth means coupled to said first means, to said fourth means and concurrently operative with said master processing unit, said third means, and said fourth means in response to said time sequential data on said output bus and to said synchronously supplied microinstructions for evaluating in accordance with said synchronously applied microinstructions one of a preselected plurality of computationally intensive functions on said data on said output bus and for providing a data value on said input bus representative of said evaluation of said selected one of said plurality of computationally intensive functions, said fifth means including a dynamically configurable multifunction pipelined arithmetic and logical unit having an M register file and a Z register file selectively interconnectable under microinstruction control by way of both a feedforward and a feedback path, wherein each of said M and said Z register files are 4 port devices having two input ports and two output ports and are operative in response to individual ones of said plurality of microinstructions to provide two writes thereinto and two reads therefrom.

4,589,068

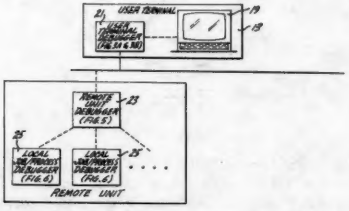
SEGMENTED DEBUGGER

Roger J. Heinen, Jr., Bellevue, Wash., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Oct. 3, 1983, Ser. No. 538,371

Int. Cl.[4] G06F *11/00*

U.S. Cl. 364—300 **16 Claims**



1. A segmented debugger for a computer system wherein at least one user terminal that includes a keyboard and display console is connected via a communication network to a plurality of remote units, each of which includes a central processing unit and at least one job/process subject to debug control, said segmented debugger comprising:

(A) a user terminal debugger located in said user terminal for:

(1) receiving debug commands entered by a user via said keyboard and display console;

(2) executing said debug commands when said debug commands are directed to said user terminal;

(3) sending said debug commands to remote unit debuggers located in said remote units when said debug commands are directed to a particular remote unit or a job/process in a remote unit that is subject to debug control; and,

(4) receiving debug messages from said remote unit debuggers and causing related information to be displayed by said keyboard and display console;

(B) a plurality of remote unit debuggers, one located in each of said plurality of remote units, for:

(1) receiving the debug commands sent to said remote units by said user terminal debugger;

(2) executing said debug commands when said debug commands are directed to the remote unit debugger receiving said debug commands;

(3) creating messages based on the results of the execution of said debug commands by said remote unit debugger;

(4) forwarding said messages to said user terminal debugger;

(5) forwarding said debug commands to the local job/process debugger to which said commands relate when said debug commands are directed to a local job/process debugger in the remote unit receiving said debug commands; and,

(6) receiving debug messages from the local job/process debuggers in said remote units and forwarding said debug messages to said user terminal debugger; and,

(C) a plurality of local job/process debuggers, one associated with each of the job/processes in said remote unit subject to debug control, for:

(1) receiving debug commands forwarded to said local job/process debuggers by said remote unit debuggers;

(2) executing said debug commands received by said local job/process debuggers from said remote unit debuggers;

(3) creating messages based on the results of the execution of said debug commands by said local job/process debuggers; and,

(4) forwarding said messages to said remote unit debuggers for forwarding by said remote unit debuggers to said user terminal debugger.

4,589,069

DATA INPUT/OUTPUT SYSTEM FOR GASOLINE STATIONS

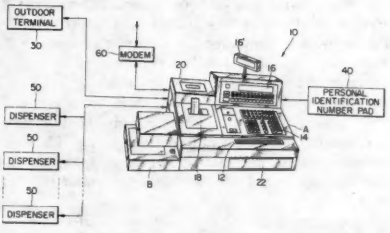
Keizo Endo; Hiroshi Matsumura; Norio Shimamura, and Masaru Kawabe, all of Tokyo, Japan, assignors to Tokyo Tatsuno Co., Ltd., Tokyo, Japan

Filed Sep. 12, 1983, Ser. No. 531,542

Claims priority, application Japan, Sep. 18, 1982, 57-162937; Sep. 18, 1982, 57-162939; Sep. 20, 1982, 57-162289

Int. Cl.[4] G06F *15/24, 7/12;* **B67D** *5/30*

U.S. Cl. 364—405 **8 Claims**



1. A data input/output system for gasoline stations, comprising a fuel dispensation control panel having a fuel dispensation request lamp operated by a fuel dispensation request signal from a concerned fuel dispenser, a fuel dispensation permission switch for making operable the concerned dispenser, and a fuel dispensation completion lamp operated by a signal from the concerned dispenser; a key board for inputing sales data of dispensed fuel and other merchandise; a display for indicating said data; a printer for printing said data on a slip; a cash box for accommodating cash, checks and the like; alarm means for issuing an alarm signal; and a control unit having a central

processing unit (CPU), a memory unit, a display and key controller, a serial communication interface for the fuel dispensers, and a printer controller, said memory unit having an alarm issuance monetary amount area in which a predetermined amount of money is memorized along with means for setting in said predetermined amount in said alarm issuance monetary amount area, said memory unit also having an area for recording the existing amount of cash accommodated in the cash box, said central processing unit having means for arithmetically increasing and decreasing the record of the amount of cash in the existing amount recording area corresponding to the amount of cash placed into and taken out of the cash box, and means for comparing said recorded amount of cash with said predetermined amount of money in the alarm issuance monetary area at each change in the recorded amount of cash and to issue a signal when the former amounts exceeds the latter amount so as to actuate said alarm means.

4,589,070

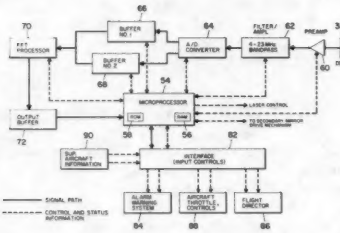
AIRBORNE WIND SHEAR RESPONSE SYSTEM

Demos T. Kyrazis, Albuquerque, N. Mex., assignor to R & D Associates, Marina del Ray, Calif.

Filed Oct. 25, 1982, Ser. No. 436,633

Int. Cl.[4] G01P *3/36;* **B64C** *13/10*

U.S. Cl. 364;424 **9 Claims**



1. An airborne wind shear safety system for mounting on an aircraft comprising:

a laser;

means for mounting said laser on an aircraft, with the laser directed substantially forwardly from the aircraft;

means for focusing said laser alternately at a near zone close to the aircraft, and at a distant zone spaced at least one-quarter mile ahead of the aircraft;

means for receiving the reflected return from aerosols or other particles in the air and for beating them with reference signals derived from said laser to provide a radio frequency signal representative of the doppler shift in the reflected signals at both the near zone and at the distant zone;

means for determining the relative speed of the air with respect to the aircraft both at the near and distant zones from said radio frequency signals;

means for determining the difference in relative speeds at the near and distant zones;

a response circuit for initiating action to avoid air craft stall; and

means for energizing said response circuit when said difference exceeds a predetermined level;

whereby wind shear is detected at least several seconds prior to a drastic change in airspeed so that appropriate corrective action may be taken.

4,589,071

METHOD AND APPARATUS FOR CONTROLLING REDUCTION RATIO OF CONTINUOUSLY VARIABLE TRANSMISSION WITH ACCELERATION COMPENSATION

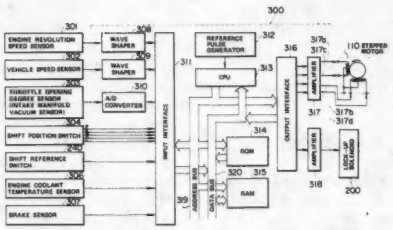
Sigeaki Yamamuro, Zushi; Keiju Abo, Yokosuka; Yoshikazu Tanaka; Haruyoshi Kumura, both of Yokohama; Hiroyuki Hirano, and Yoshiro Morimoto, both of Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

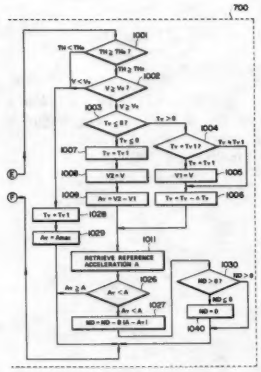
Filed Apr. 19, 1983, Ser. No. 486,501

Claims priority, application Japan, Apr. 19, 1982, 57-63866; Apr. 30, 1982, 57-71510

Int. Cl.[4] B60K *41/18;* **F16H** *9/18, 11/06;* **G05D** *17/02*

U.S. Cl. 364—424.1 **22 Claims**





5. A method for controlling a motor vehicle having an internal combustion engine and a continuously variable transmission operatively coupled with the engine, said method comprising the steps of:

detecting vehicle speed of the motor vehicle at predetermined intervals of time and generating a vehicle speed indicative signal indicative of the vehicle speed detected;

determining an actual acceleration based on said vehicle speed indicative signal and generating an actual acceleration indicative signal indicative of the actual acceleration determined;

determining a reference acceleration and generating a reference acceleration indicative signal indicative of the reference acceleration determined;

comparing said actual acceleration indicative signal with said reference acceleration indicative signal and generating a comparison result indicative signal when said actual acceleration indicative signal attains a predetermined relationship with said reference acceleration indicative signal;

determining, responsive at least to said vehicle speed indicative signal, a first desired reduction ratio;

executing a first routine which includes a step of adjusting an actual reduction ratio of the continuously variable transmission toward said first desired reduction ratio;

switching from said first routine executing step after said comparison result indicative signal has been generated after a predetermined condition has been met to executing a second routine which includes a step of correcting said first desired reduction ratio to give a second desired reduction ratio and a step of adjusting the actual reduction ratio of the continuously variable transmission toward said second desired reduction ratio; and

repeating said vehicle speed detecting step, said actual acceleration determining step, said reference acceleration determining step, said comparing step and said second routine executing step as long as said comparison result indicative signal is generated and said predetermined condition is met until said actual acceleration indicative signal fails to attain said predetermined relationship with said reference acceleration indicative signal.

4,589,072

APPARATUS FOR AUTOMATICALLY MEASURING AND CONTROLLING CHEMICAL REACTION AMOUNT

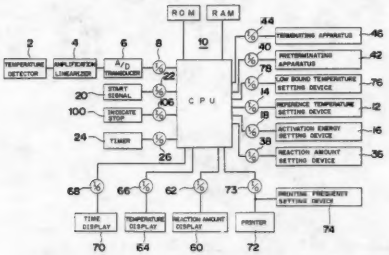
Toshio Arimatsu, Akashi, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo, Japan

Continuation-in-part of Ser. No. 402,893, Jul. 29, 1982, abandoned. This application Feb. 27, 1985, Ser. No. 706,317

Claims priority, application Japan, Aug. 5, 1981, 56-123462; Nov. 6, 1981, 56-178488; Nov. 6, 1981, 56-178489; Nov. 6, 1981, 56-178490; Nov. 6, 1981, 56-178491

Int. Cl.[4] **B01J** *19/00;* **B29H** *5/24;* **G05D** *21/02*

U.S. Cl. 364—473 **14 Claims**



12. A reaction amount measuring and controlling apparatus for measuring the reaction amount and for controlling the reaction in a reaction system comprising:

a plurality of temperature detectors provided at different places in the interior and/or the outer surface of a reaction system and/or in a container of said reaction system, each temperature detector producing a temperature signal;

signal selecting means for selecting one or more signals from said temperature detectors;

a multiplexer for supplying the temperature signals from the detector to a computer;

setting means for setting a desired reaction amount;

said computer being connected to said signal selecting means for receiving selected temperature signals, said computer having multi-functions of a calculation function for calculating a reaction amount in accordance with said temperature signal, an average taking function for taking an average of reaction amounts as calculated, a maximum value-taking function for taking a maximum value of reaction amounts as calculated, a minimum value-taking function for taking a minimum value of reaction amounts as calculated, and a comparing function for comparing said desired reaction amount with a variant which is any one of a calculated reaction amount, average reaction amount, a maximum reaction amount and minimum reaction amount, and for producing a signal when said variant reaches or exceeds said desired reaction amount, said computer further including means for generating a signal for starting said calculation;

function selecting means for arbitrarily selecting functions from said multi-function computer such that said function selecting means arbitrarily selects a combination of calculation function and comparing function, a combination calculation functin, average-taking function and comparing function, a combination of calculation function, maximum value-taking function and comparing function, or a combination of calculation function, minimum value-taking function and comparing function; and

means for controlling said reaction system based on said calculated reaction amount.

4,589,073

APPARATUS FOR DETERMINING PROSPECTIVE SHORT CIRCUIT CURRENT

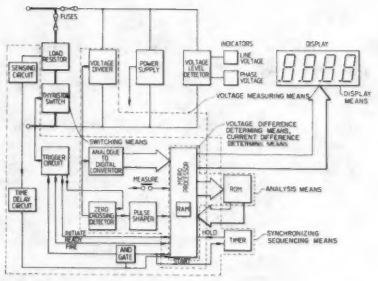
Alan L. Kidd, Southport, England, assignor to Dorman Smith Switchgear Limited, Great Britain

Filed May 3, 1983, Ser. No. 491,294

Claims priority, application United Kingdom, May 5, 1982, 8212989

Int. Cl.[4] **G06F** *15/56;* **G01R** *27/16;* **H02H** *3/08*

U.S. Cl. 364—483 **11 Claims**



1. Apparatus for determining the prospective short circuit current between conductors at any position in an electrical installation, comprising:

means for measuring the voltage at at least one predetermined point of a half cycle of the operating voltage between the conductors;

a load impedance;

switching means for connection and disconnection of the load impedance between said conductors to cause a current to flow therebetween for a short period, said current flow being of sufficient magnitude to change the voltage between the conductors and the time duration of the half cycle;

means for synchronising and sequencing operation of said voltage measuring means and actuation of said switching means;

means for measuring the differences in voltages caused by said current flow;

means for determining the differences in the time duration of the half cycle caused by said current flow;

analysis means having a random access memory and a read only memory, the read only memory having stored therein predetermined values of voltage differences and time duration and corresponding predetermined values for the prospective short circuit current, the analysis means storing said voltage difference measurements and time duration difference measurements in said random access memory and comparing them with the predetermined values stored in the read only memory to derive the

corresponding measured value of the prospective short circuit current between said conductors; and,

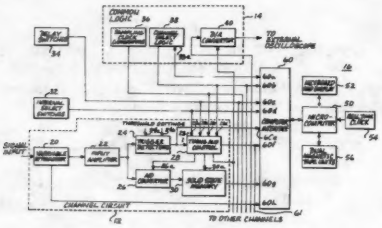
display means coupled to said analysis means for displaying directly said measured value of the prospective short circuit current.

4,589,074

MULTIPLE CHANNEL POWER LINE MONITOR

Teddy R. Thomas, Renton; David L. Sommer, Everett, and Greg J. Von Bokern, Kent, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Aug. 31, 1983, Ser. No. 527,999
Int. Cl.[4] G01R *19/00*
U.S. Cl. 364—483 **29 Claims**



1. Apparatus for monitoring a plurality of electrical power carrying lines comprising:

a plurality of channel circuits, each channel circuit including:

(a) an input adapted to be coupled to one of said power carrying lines for sensing the signal thereon,

(b) trigger detector means for producing a trigger detect signal in response to said sensed signal at said input exceeding a predetermined reference level,

(c) analog-to-digital converter means for controllably converting said sensed signal at said input to corresponding digital signals,

(d) memory means for controllably storing said analog-to-digital converter means produced digital signals, and

(e) timing and control circuit means responsive to control signals for controlling said analog-to-digital converter means and said memory means;

a common logic circuit comprising:

(a) a sampling clock generator means for producing a sampling clock signal, said sampling clock signal being coupled to each channel circuit timing and control circuit means for controlling the sampling rate of the corresponding analog-to-digital converter,

(b) channel select logic means responsive to control signals for selecting a predetermined one of the plurality of channel circuits, and

(c) digital-to-analog converter means for converting the stored digital signals in a selected channel circuit memory means to a corresponding analog signal; and

control logic means for controlling the operation of the channel circuits and the common logic circuit in either a selected manual or an automatic mode, said control logic means including storage means for controllably storing digital signals,

the control logic means being operable in the manual mode for:

(a) responding to a trigger detect signal produced by the trigger detector means of a channel circuit to cause the channel select logic means to select said channel circuit such that an analog signal out of said digital-to-analog converter means is provided for review by an operator, and

(b) providing an operator with a means for loading the digital signals stored in the memory means of said selected channel circuit into said storage means,

the control logic means being operable in the automatic mode for:

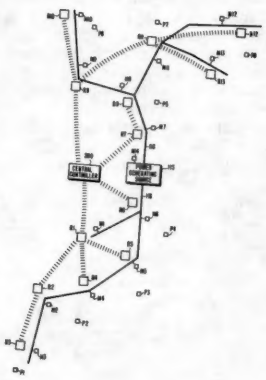
responding to a trigger detect signal produced by the trigger detector means of a channel circuit to cause the memory means of said channel circuit to load the digital signals stored therein into said storage means; said control logic means including means operable in the manual mode and the automatic mode for assigning a predetermined priority to each of the channel circuits such that in the even at least two trigger detector means produce trigger signals simultaneously, each circuit channel is processed in the order of its assigned priority.

4,589,075

REMOTE LOAD DATA ACQUISITION AND CONTROL SYSTEM FOR A POWER NETWORK

James A. Buennagel, 2228 N. Lesley, Indianapolis, Ind. 46218

Filed Feb. 23, 1983, Ser. No. 469,083
Int. Cl.[4] H04B *7/24*; H04Q *9/00*; G05F *1/66*
U.S. Cl. 364—492 **5 Claims**



1. A remote load data acquisition and control system for a power network, the power network including a power generating source and a plurality of separately controllable loads, said system comprising:

(a) a plurality of addressable remote load controllers, at least some of said addressable load controllers including:

(1) radio receiver means;

(2) decoder means for decoding radio transmissions received into digital messages;

(3) an address identifier; and

(4) means for connecting and disconnecting a load to and from the power generating source in response to received commands when the load controller receives and decodes the address identifier of that load controller;

(b) a plurality of addressable power load monitors, at least some of said addressable power load monitors including:

(1) radio receiver means;

(2) decoder means for decoding received radio transmissions into digital messages;

(3) an address identifier;

(4) load sensing means for sensing the extent of load on the power network at a point in the power network;

(5) means for accessing said load sensing means and generating digital load data messages indicating the extent of load on the power network at a point in the power network when the power load monitor receives and

decodes the address identifier of that power load monitor;

(6) means for encoding and transmitting said load data messages;

(c) a central controller, said central controller including:

(1) central controller processor means for processing power load data and generating digital messages, said central controller generated digital messages including retransmission network messages and load management messages, said load management messages including

(i) load control messages which address said addressable remote controllers and command the selective connection and disconnection of loads connected to addressed remote load controllers, and

(ii) data aquisition messages which address power load monitors;

(2) central radio frequency transmitter means for transmitting said digital messages; and

(3) central controller receiver means for receiving power load data messages;

(d) a network of retransmission stations, said retransmission stations including:

(1) receiver means for receiving radio transmissions;

(2) a radio frequency transmitter;

(3) decoder means for decoding radio transmissions received into digital messages;

(4) a plurality of directional antennas connectable to said receiver and transmitter means; and

(5) retransmission network processing means for processing received retransmission network messages, said retransmission network processing means including:

(i) means for selectively retransmitting received radio transmissions within said retransmission network in response to received retransmission network messages;

(ii) means for selectively retransmitting received load control messages in response to other received retransmission network messages; and

(iii) means for selectively retransmitting received data acquisition messages in response to yet other received retransmission network messages;

(iv) means for retransmitting received load data messages within said retransmission network toward said central controller receiver means; and

(v) means for selectively controlling the connection and disconnection of said directional antennas to said receiver and transmitter means in response to certain retransmission network messages.

4,589,076

METHOD FOR CONTROLLING STRETCHING AND CONTRACTING OPERATIONS OF TELESCOPIC MULTISTAGE BOOM

Jun Fujioka, Akashi, Japan, assignor to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Oct. 17, 1983, Ser. No. 542,489

Int. Cl.[4] G06F *15/20;* **B66C** *23/00*

U.S. Cl. 364—508 **5 Claims**

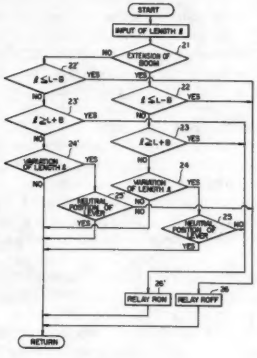
1. A method for controlling a plurality of boom operating cylinders in extending and contracting operations of a multistage telescopic boom including a boom length detector, a base boom portion, an intermediate boom portion and a fore boom portion, said method comprising:

detecting the length of said telescopic boom by means of said boom length detector;

permitting selective extension or contraction of a cylinder of said intermediate boom portion when the value (l) of a detected length is smaller than a first preset reference value $(L-\beta)$ which is determined by subtracting a predetermined arbitrary length (β) from an actual length L of said boom when said intermediate boom portion is fully extended relative to said base boom portion and said fore boom portion is fully contracted relative to said intermediate boom portion;

permitting extension or contraction of a cylinder of said fore boom portion alone when the detected value (l) is greater than a second predetermined reference value $(L+\beta)$;

detecting whether a variation per unit time of said detected value (l) is in a range between said first and second reference values $(L-\beta)$ and $(L+\beta)$;



continuing boom extension or contraction of a currently operating cylinder when said variation is greater than a predetermined value; and

switching boom extending or contracting operation to a cylinder of a said fore boom portion or said intermediate portion at a point in time when said variation becomes smaller than said predetermined value.

4,589,077

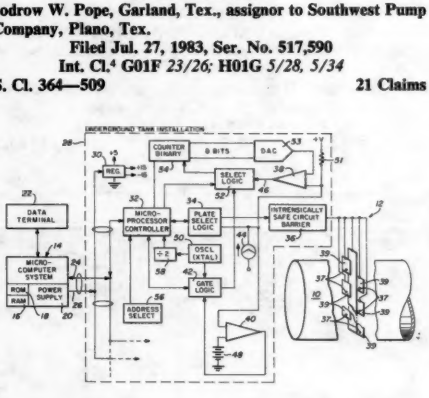
LIQUID LEVEL AND VOLUME MEASURING METHOD AND APPARATUS

Woodrow W. Pope, Garland, Tex., assignor to Southwest Pump Company, Plano, Tex.

Filed Jul. 27, 1983, Ser. No. 517,590

Int. Cl.[4] G01F *23/26;* **H01G** *5/28, 5/34*

U.S. Cl. 364—509 **21 Claims**



12. A method of measuring the volume of fuel within a tank by means of a micro-processor based measuring system sequentially connected by means of oscillator controlled gating logic to an elongated multi-segment capacitance probe that includes a column of capacitors extending through a liquid level of the fuel, comprising the steps of:

generating and storing data corresponding to the capacitance value for each of the capacitors in the column,

sequentially generating a signal representing the capacitance

value of each of the capacitors in the column starting at one end thereof,

comparing by means of a comparator in the measuring system the generated capacitance value signal for a given capacitor in the column with the generated data capacitance value thereof,

interrupting the sequential generating of the capacitance value signal in the column when the comparison produces a result indicating a liquid level interface,

generating a signal representing the capacitance value of a capacitor in the column below the capacitor at which the comparison indicates a liquid level interface,

computing the height of the liquid level interface within the tank by means of the micro-processor from the generated capacitance value signal of the capacitor below the interface and the generated capacitance value signal of the capacitor at the interface, and

calculating the volume of the fuel within the tank by means of the micro-processor from the computed height and from predetermined volume calibrations.

17. Apparatus for measuring the location of the liquid level in a tank by means of an elongated multiple segment capacitive probe extending in the direction through the liquid level, comprising:

a micro-processor for controlling the connection of a current source by means of oscillator controlled gating logic to the multiple segment capacitance probe,

means for charging an identified capacitor in the column by connection to the current source in response to the oscillator controlled gating logic,

means for comparing the charge on the identified capacitor with a stored reference level value,

a counter for accumulating a count in response to the oscillator control gating logic until the charge on the identified capacitor equals the stored reference level value, wherein the accumulated count is a measure of the capacitance value of the capacitor, and

means for computing the height of the liquid level in the tank by means of the micro-processor from the measured capacitance value of the capacitor in the column at the liquid level.

4,589,078

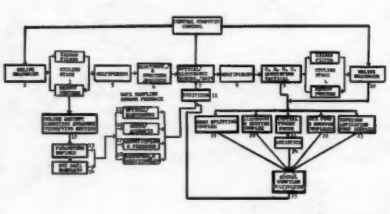
PROGRAMMING FORMAT AND APPARATUS FOR THE IMPROVED COHERENT BEAM COUPLER SYSTEM AND METHOD

Larry Rosenberg, 3440 Caroline Ave., Culver City, Calif. 90230

Filed May 27, 1983, Ser. No. 498,773

Int. Cl.[4] G06F *15/20*; G05B *19/00*

U.S. Cl. 364—524 **11 Claims**



1. An apparatus for controlling an electronic controlled energy altering and delivery system in accordance with preprogrammed data to provide laser darticlization, doppler analysis, laser telemetry and related processes for target sites having aberrant conditions comprising:

energy control and modification means for determinate targeting and compositional analysis by emissive sources of said target sites and the subsequent obliteration of aberrant conditions;

entry means for providing data to define the targets including target loci, chemical analysis, and structural analysis on a current status basis for targeted sites undergoing the laser darticlization, doppler analysis, laser telemetry and related processes;

storage means operatively coupled to the entry means for storing pertinent data provided by the entry means concerning the targets including target loci, chemical analysis and structural analysis on an accumulated basis and for comparing said pertinent data provided by said entry means with said preprogrammed data;

data display means operatively coupled to the storage means for displaying ambient conditions prior to the darticlization process to provide the initial status of the target site, for assessment by the user for expressed purposes of nondeterministic command sequencing, priority reassignment and related process;

control means responsive to specified conditions which are either of a programmed or unprogrammed but computable nature, for collating the data entered by the said entry means with data obtained from said storage means for controlling the energy content, electronic wave characteristics and the direction of the emissive sources controlled by the said energy control and modifiction means;

said control means comprising at least four interactive expandable levels of operations using EPROM, EEPROM or equivalent capacities, each of which is associated with a common feedback loop detection network providing data transmission paths between manually keyed operations, computer actuated controlled operations, user priority interactive graphics, and priority command voice recognition equivalency mode;

each of said levels containing microprocessors or their equivalents and additionally including means for cyclically providing for separate individual synchronizing signals for the various interactive operative levels;

coincidence detecting means for detecting coincidence of said synchronizing signals of said interactive operative levels, and said data transmission paths being responsive to the output of said coincidence detecting means for direct transmission between the various interactive and operative levels; and

the microprocessor or their equivalents for controlling by said control means, said energy content, electronic wave characteristics and the direction of the emissive beams in accordance with the data entered into and transmitted between said interactive operative levels.

4,589,079

EVALUATION CIRCUIT FOR THE SIGNALS FROM AN ARRAY OF N PHOTOCONDUCTORS WHICH ARE SUCCESSIVELY SCANNED IN A FAST RHYTHM

Klaus J. Peter, Isen, Fed. Rep. of Germany, assignor to FICHT GmbH, Kirchseeon, Fed. Rep. of Germany

PCT No. PCT/EP82/00166, § 371 Date Ap.. 1[illegible]983, § 102(e) Date Apr. 14, 1983

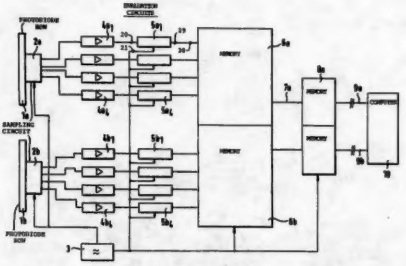
PCT Filed Aug. 6, 1982, Ser. No. 491,327

Int. Cl.[4] G06G *7/48, 7/80*

U.S. Cl. 364—551 **13 Claims**

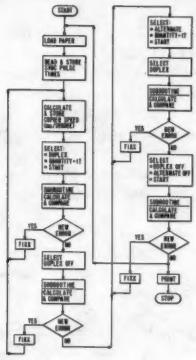
1. In a device for determining the point of passage of a moving object through a measuring plane, the device including (1) two mutually inclined cameras arranged at a distance from one another, each being provided with a row of n photodetectors which are scanned successively in a fast rhythm to provide sampled signals from each row of photodetectors; (2) an evaluation circuit including two portions to which are fed the sampled signals from a respective row of photodetectors, each portion of the evaluation circuit including a delay device for delaying the signals derived from the n photodetectors of the respective row as well as a comparison circuit which compares output signals derived from the same photodetectors but offset in time and emits a 0 or 1 signal depending on the difference between the signals; and (3) a computer which receives the output signals from the comparison circuit of both portions of the evaluation circuit for determining the coordinates of the

point of passage, the improvement wherein: each portion of the evaluation circuit includes at its input an analog/digital converter; the delay devices comprise digital double memories in which are stored those signals which are derived from the signals of the respective photodetector rows during the last



two sampling cycles; and the comparison circuits receive the signal just derived from a photodetector and the corresponding signal derived two sampling cycles earlier, said comparison circuits forming the quotients of these signals and comparing them with a threshold value.

storing as digital result values the results of the comparisons; and



signaling as a potential failure each stored digital result value representing an average or variance exceeding its corresponding copier operational limit.

4,589,080

APPARATUS AND METHOD FOR PREDICTING FAILURE IN A COPIER'S PAPER PATH

Jerry J. Abbott; James E. Bierschbach; Keith N. Bobo, all of Longmont, and Greg S. Herring, Boulder, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 11, 1982, Ser. No. 387,722
Int. Cl.[4] G06F *15/20*; G06G *7/48*
U.S. Cl. 364—552 **3 Claims**

1. A method for predicting and identifying failure of an electrophotographic copier before a failure occurs, comprising the steps of:

monitoring selected signal-supply points of the copier;

detecting the occurrence of signals at the selected points;

timing detected signals;

assigning to individual detected signals current digital time values representing the time at which the signal occurred;

storing digital values including a plurality of preselected digital limit values representing copier operational limits;

calculating differences between chosen pairs of current digital time values;

storing the differences as digital difference values;

generating digital statistical values, representing averages and variances as a function of the stored digital difference values;

storing the generated digital statistical values;

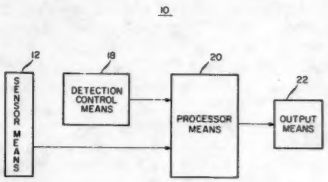
comparing one by one, digital statistical values representing averages and variances with digital limit values representing copier operational limits corresponding to said values;

4,589,081

INTELLIGENT SURVEILLANCE ALARM SYSTEM AND METHOD

Ronald J. Massa, Bedford; Theodore R. Ellis, Rockport, and Robert G. LePage, Littleton, all of Mass., assignors to Dynatrend, Incorporated, Woburn, Mass.

Filed Mar. 15, 1983, Ser. No. 475,445
Int. Cl.[4] B60Q *1/54*
U.S. Cl. 364—554 **37 Claims**



1. An anomaly detection system comprising:

a plurality of sensor means for providing an output representative of the current operational environment of the subject premises;

means, responsive to said output, for translating said output to a signal;

control means for defining the normal operational parameters of said subject premises by specifying expected normal states of and a predetermined combination of required detection states for said sensor means;

stochastic means, responsive to said output representative of the current operational environment, for periodically adjusting said definition of said normal operational parameters of said subject premises to accommodate routine changes in the current operational environment;

processor means for comparing said output representative of said current operational environment with said updated definition of said normal operational parameters of said subject premises, and for detecting a deviation therebetween;

output means, responsive to said means for comparing and detecting, for providing an output representative of said detected deviation between said output representative of said current operational environment and said normal operation parameters of said subject premises; and

a plurality of response devices, responsive to said output means, for providing a specific response sequence representative of the nature and location of said detected deviation.

4,589,082

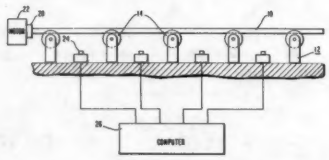
NUCLEAR FUEL ROD STRAIGHTNESS MEASURING SYSTEM AND METHOD

Merle A. Parker, and Hassan J. Ahmed, both of Columbia, S.C. assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 17, 1983. Ser. No. 458,407

Int. Cl.[4] G01B *5/20*

U.S. Cl. 364—561 **13 Claims**



1. A method for measuring the straightness of a rod, comprising the following steps:

(a) supporting said rod so that if said rod were straight, said rod would remain straight without transverse translational movement while supported and if rotated about its longitudinal axis, and so that if said rod were cambered, said rod would remain so cambered while supported and if rotated;

(b) rotating the supported said rod so that if said rod were straight, said rod would be rotated about its longitudinal axis;

(c) measuring the distances during said rotation between the supported and rotating said rod and a plurality of rigidly-mounted, spaced-apart range finders, said range finders disposed apart from and directed towards the supported and rotating said rod and disposed so that if said rod were straight, said range finders would each be directed transverse to said longitudinal axis; and

(d) calculating for each of said range finders the difference between the maximum and minimum of its said distance measurements, said differences indicating the degree of straightness of said rod.

4,589,083

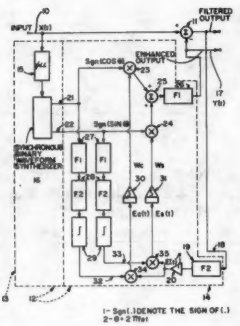
ADAPTIVE SINUSOIDAL INTERFERENCE FILTER

Chon T. Le Dinh, Brossard, and André Leblanc, Laval, both of Canada, assignors to Centre de Recherche Industrielle du Quebec, Quebec, Canada

Continuation of Ser. No. 430,700, Sep. 30, 1982, abandoned. This application Jun. 14, 1985, Ser. No. 744,654

Int. Cl.[4] G06F *15/31*

U.S. Cl. 364—724 **6 Claims**



1. An adaptive filtering system for filtering a sinusoidal interference signal contained within the useful bandwidth of a desired wide-band signal, said system comprising:

an input terminal and an output terminal;

means for phase-tracking the interfering signal contained within the wide-band signal by the use of a phase-lock loop circuit including an oscillator, said means being connected to said input terminal of said system;

means for generating two synchronous square wave signals in phase quadrature, synchronous with said interfering signal, said means for generating two synchronous square wave signals being driven by said oscillator in said phase-lock loop circuit;

means for filtering and limiting the said two synchronous square wave signals;

means for generating two weighted signals including filter means connected to said output terminal, two multipliers connected to said filter means and said means for filtering and limiting, and two intergrators connected to said two multipliers to produce said two weighted signals

weighting second multiplier means coupled to said two integrators and said means for generating two synchronous square wave signals for generating two weighted square wave signals;

mixing means for combining said weighted square wave signals for producing a combined weighted signal;

an output filter connected to said mixing means to produce a signal which is an estimate of the interference in said input signal;

an output combiner connected to said input terminal and said output filter for receiving said estimate signal to cancel the interfering signal in said input signal and produce an output signal substantially free of sinusoidal interference at said output terminal.

4,589,084

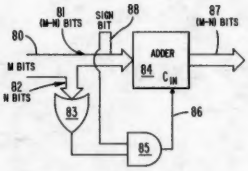
APPARATUS FOR SYMMETRICALLY TRUNCATING TWO'S COMPLEMENT BINARY SIGNALS AS FOR USE WITH INTERLEAVED QUADRATURE SIGNALS

Russell T. Fling, Noblesville, and Saiprasad V. Naimpally, Indianapolis, both of Ind., assignors to RCA Corporation, Princeton, N.J.

Filed May 16, 1983, Ser. No. 495,116

Int. Cl.[4] G06F 7/38; H04N 9/64

U.S. Cl. 364—745 **18 Claims**



1. Apparatus for truncating an M-bit two's complement binary signal to (M−N) bits wherein the MSB of the M bit signal is a sign bit and M and N are integers, said apparatus comprising:

an input port for applying said M-bit binary signal;

means coupled to said input port, and responsive to the N LSB's of said M-bit binary signal and the MSB of said M-bit binary signal for producing a control signal whenever at least one of said N LSB's of the M-bit binary signal and the MSB of said M-bit binary signal are concurrently in a logical one state;

means coupled to said input port, and responsive to said control signal, for incrementing by one unit the (M−N) MSB's of said M-bit binary signal and providing the incremented (M−N) MSB's as a truncated (M−N)-bit binary signal, and in the absence of said control signal providing the (M−N) MSB's of said M-bit binary signal as a truncated (M−N)-bit binary signal.

4,589,085

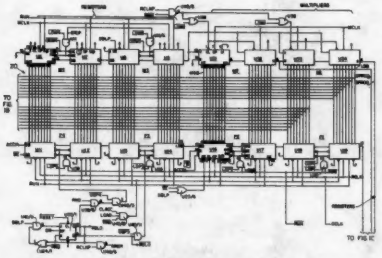
HARDWARE MULTIPLIER PROCESSOR

Paul E. Pierce, Albuquerque, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 26, 1983, Ser. No. 488,824

Int. Cl.[4] G06F 7/52

U.S. Cl. 364—754 **17 Claims**



1. An addressable electronic processor, for performing high speed mathematical operations connected to a multibit external address bus and to an external data bus, comprising:

address receiving means for receiving coded address signals from the address bus;

data I/O means for receiving and providing data signals to and from the data bus, said data signals being in parallel with some of said address signals;

decoding means, connected to said address receiving means, for generating a unique combination of control signals for each received address;

data manipulation means, connected to said data I/O means and decoding means, for storing and manipulating the data signals under control of the control signals, said means comprising:

multiplying means for receiving data signals when a first combination of control signals is actuated, and for generating a multiplied value of two data signals when a second combination of control signals is actuated;

results storage means for storing a predetermined value;

arithmetic circuit means for performing serial arithmetic operations on two operands and sending the resulting value to said results storage means, said operations including:

selectively adding or subtracting the multiplied value and the predetermined value and storing the resulting value as the predetermined value, when activated by control signals responsive to an address indicative of the selected operation, and

adding a rounding pulse to the predetermined value at a preselected bit as controlled by a particular combination of control signals responsive to the particular coded address signal received by the processor, wherein varying the bit to which the pulse is added or subtracted varies the scaling and rounding of the predetermined value.

4,589,086

DATA PROCESSING SYSTEM

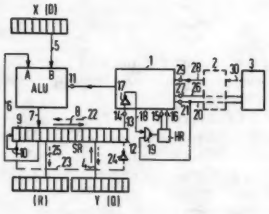
Wolfgang Beifuss; Bernd Haussmann, both of Munich; Michael Pomper, Schliersee, and Ewald Soutschek, Putzbrunn Waldkolonie, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 30, 1982, Ser. No. 413,213

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1981, 3134057

Int. Cl.[4] G06F 7/52

U.S. Cl. 364—760 **9 Claims**



1. In a data processing system having an arithmetic/logical unit, two operand registers with capacity n and a shift register with capacity 2 n designed for a Booth multiplication or division of two operands, the combination comprising;

a logical control circuit for supplying operation code inputs to said arithmetic/logical unit, said logical control circuit being connected over a first input to an output of said shift register,

a single-place auxiliary register means connecting an input of said logical control circuit to the least significant output of said shift register, said logical control circuit having a multiplexer connected to and responsive to said auxiliary register for the selective connection of operation code signals directly from its inputs and over its outputs to the operation code inputs of said arithmetic/logical unit.

4,589,087

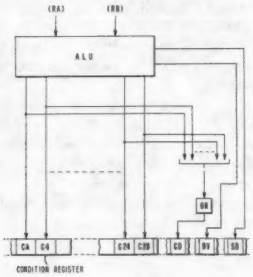
CONDITION REGISTER ARCHITECTURE FOR A PRIMITIVE INSTRUCTION SET MACHINE

Marc A. Auslander, Millwood; John Cocke, Bedford; Hsieh T. Hao, Chappaqua; Peter W. Markstein, Yorktown Heights, and George Radin, Piermont, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1983, Ser. No. 509,744

Int. Cl.[4] G06F *7/48*

U.S. Cl. 364—768 **11 Claims**



1. In a digital electronic computing system having a single machine cycle executable instruction set and including a memory hierarchy comprising a main memory and a highspeed cache, a Central Processing Unit (CPU) and a bus network interconnecting said memory hierarchy and said CPU, said CPU including an Arithmetic and Logic Unit (ALU) for performing arithmetic and logical operations on data supplied thereto including an N-bit adder, an instruction execution unit operable in cooperation with an instruction register and a plurality of simultaneously accessible general purpose registers to supply operands to said ALU and to control said ALU for processing primitive instructions to be performed by said system, and condition code generating means for generating a plurality of specified condition bits in accordance with the output of the ALU and the instruction unit to store the state of certain operations occurring during a current machine cycle, the improvement which comprises a system architecture in which said condition code generating means includes:

an expanded condition register, containing N/4 carry bit storage locations where N equals the number of bits in the adder,

means for performing decimal add/subtract operations in the system utilizing said expanded condition register including,

means for converting one of two decimal operands coded in BCD format to a hexadecimal representation by adding the decimal value 6 to each decimal digit of the operand before performing a decimal ADD/SUBTRACT operation,

means for setting a condition register bit (CA, C4, C8, . . . CN) inthe event of a 'carry' out of any four bit hexademical subfield of the adder for bits 0, 4, 8, . . . N, where N is a multiple of four, for decimal ADD/SUBTRACT operations and means for converting the hexadecimal result back into a BCD representation.

4,589,088

REMOTE DATA GATHERING PANEL

William C. Place, Acton, Mass., assignor to Honeywell Inc., Minneapolis, Minn.

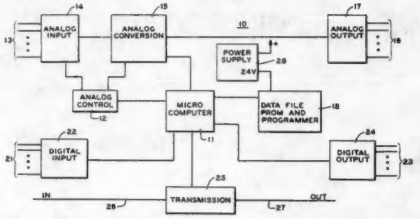
Division of Ser. No. 232,793, Feb. 9, 1981, Pat. No. 4,423,408. This application Oct. 3, 1983, Ser. No. 538,445

Int. Cl.[4] G06F *13/00*

U.S. Cl. 364—900 **5 Claims**

1. A data gathering panel for permitting the rewriting of a programmable read-only memory under control of a remote station connected to said data gathering panel by a communication channel comprising:

programmable read-only memory means for storing information to be used by said data gathering panel for controlling at least some functions performed by said data gathering panel;



power supply means in said data gathering panel for allowing the information stored in said programmable read-only memory means to be altered; and

control means responsive to remote transmissions from a remote station over a communication channel for interconnecting said power supply means and said programmable read-only memory means for altering said information stored in said programmable read-only memory means.

4,589,089

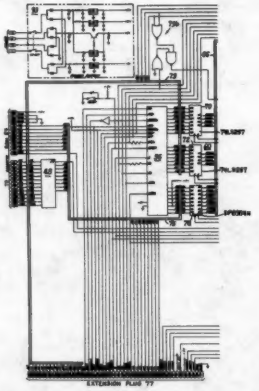
COMPUTER-PERIPHERAL INTERFACE FOR A GAME APPARATUS

Jeffrey E. Frederiksen, Arlington Heights, Ill., assignor to Bally Manufacturing Corporation, Chicago, Ill.

Division of Ser. No. 910,964, May 30, 1978, Pat. No. 4,301,503, which is a continuation-in-part of Ser. No. 812,662, Jul. 5, 1977, Pat. No. 4,296,930, which is a continuation of Ser. No. 635,406, Nov. 26, 1975, abandoned. This application Jun. 18, 1981, Ser. No. 275,131

Int. Cl.[4] G06F *3/153*

U.S. Cl. 364—900 **6 Claims**



1. An interface for interfacing a computer to a peripheral device wherein the computer provides a plurality of address signals on a plurality of address lines, a plurality of data signals on a plurality of data lines, and a plurality of control signals on a plurality of control lines, said interface comprising:

control means having inputs operatively connected to the computer control lines and having output lines for supply-

ing multiplexer control signals in response to the computer control signals;

multiplexer means having inputs operatively connected to the address lines and control means output lines and having multiplexer data lines operatively connected to the peripheral device, for sequentially conducting groups of address signals on the multiplexer data lines to the peripheral device in response to the control means control signals; and

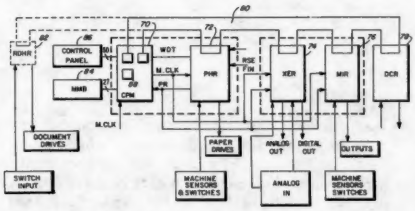
gating means, coupled to the computer data lines, the multiplexer data lines and the control means output lines, for conducting data signals from the peripheral device on the multiplexer data lines to the computer data lines in response to the computer control means control signals.

4,589,090

REMOTE PROCESSOR CRASH RECOVERY

Curtis B. Downing; Stephen P. Wilczek, both of Fairport; Richard T. Ziehm, Webster; Anthony M. Federico, West Webster; Raymond R. Husted, and Michael E. Edmunds, both of Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 21, 1982, Ser. No. 420,965
Int. Cl.[4] G06F *11/00*
U.S. Cl. 364—900 **5 Claims**



1. In a multiprocessor machine control for controlling the operation of a printing machine having a plurality of machine components cooperating with one another to produce images on support material, the machine control including a plurality of control boards, each of the control boards controlling the operation of a portion of the machine components, one of the components being non-essential for producing images on the support material, one of the plurality of control boards being a master control board connected by reset circuitry to the other control boards, the master control board including a memory for storing status information of the other control boards, the method of recovering from a malfunction involving the control boards comprising the steps of

(1) identifying a particular control board manifesting a malfunction,

(2) the master control board attempting to reset said particular control board via the reset circuitry,

(3) checking the operability of said particular control board,

(4) determining said particular control board is inoperable but non-essential for producing image on the support material,

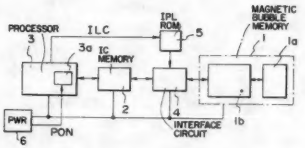
(5) continuing operation of the machine to produce images on the support material without the availability of said particular control board and saving status information for said particular control board in said memory.

4,589,091

NUMERICAL CONTROL DEVICE

Ryoji Imazeki, Hachioji, and Mitsuo Kurakake, Kokubunji, both of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

PCT No. PCT/JP80/00149, § 371 Date Mar. 2, 1981, § 102(e) Date Feb. 20, 1981, PCT Pub. No. WO81/00158, PCT Pub. Date Jan. 22, 1981
Continuation-in-part of Ser. No. 243,935, Mar. 2, 1981, abandoned. This PCT application Jun. 30, 1980, Ser. No. 572,137
Claims priority, application Japan, Jun. 30, 1979, 54-90562[U]
Int. Cl.[4] G06F *7/00, 13/00*
U.S. Cl. 364—900 **5 Claims**



1. A memory system for a numerical control device having a power source, having a memory, and having a processor connected to said memory, the processor for executing numerical control processing on the basis of data stored in said memory, wherein said memory system comprises:

a magnetic bubble memory;

an integrated circuit memory; and

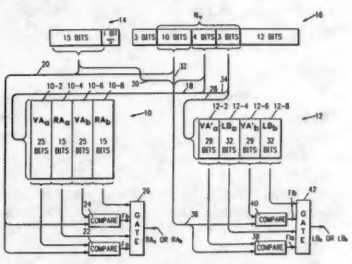
an interface circuit, connected between said magnetic bubble memory and said integrated circuit memory and connected to the power source, for transferring data between said magnetic bubble memory and said integrated circuit memory so that the data stored in said magnetic bubble memory is transferred to and stored in said integrated circuit memory through said interface circuit when power from the power source of the numerical control device is applied thereto, wherein numerical control processing is executed in accordance with the data in said integrated circuit memory.

4,589,092

DATA BUFFER HAVING SEPARATE LOCK BIT STORAGE ARRAY

Richard E. Matick, Peekskill, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 12, 1983, Ser. No. 560,479
Int. Cl.[4] G06F *12/10, 12/14*
U.S. Cl. 364—900 **7 Claims**



1. Address translation apparatus for a virtual memory data processing system comprising:

a translation lookaside buffer (TLB) array containing a plurality of virtual and associated real addresses, a discrete

lock bit array (LBA) containing a subgroup of said virtual addresses and separate lock bits associated with each of said virtual addresses of said subgroup,

means for accessing said TLB for obtaining a real address output associated with a given virtual address input signal, and

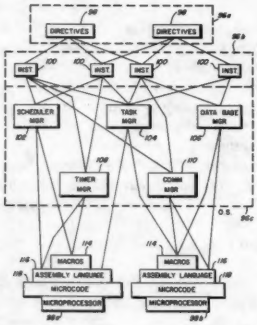
means for accessing said LBA for obtaining a lock bits output associated with said given virtual address input signal when said given virtual address is contained within said subgroup of virtual addresses in said LBA wherein a lock bit associated with a translated real address and the translated real address are accessed in parallel from the individual arrays.

4,589,093

TIMER MANAGER

Ronald A. Ippolito, Rochester, and Ernest L. Legg, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 28, 1983, Ser. No. 479,622
Int. Cl.⁴ G06F *9/00*
U.S. Cl. 364—900 **10 Claims**



1. A machine control for a machine having a marker and an image receptor for providing images on support material, said control selectively executing or delaying the execution of a plurality of tasks for producing said images, each of said tasks including at least one high level instruction, the control comprising

a processor portion, and

an operating system portion cooperating with the processor portion, said operating system portion including

a Timer Manager for timing the execution of the tasks, and

a plurality of Instruction Modules, the Instruction Modules invoking said Timer Manager to execute the high level instructions, and to provide timing control for execution of said tasks for producing said images.

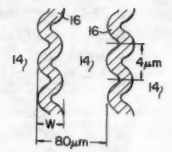
4,589,094

MAGNETIC BUBBLE DEVICE

Teruaki Takeuchi, Kokubunji; Ryo Suzuki, Hachioji; Naoki Kodama, Hachioji; Masatoshi Takeshita, Hachioji, and Yutaka Sugita, Tokorozawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 24, 1984, Ser. No. 633,929
Claims priority, application Japan, Jul. 27, 1983, 58-135817
Int. Cl.⁴ G11C *19/08*
U.S. Cl. 365—36 **6 Claims**

1. A magnetic bubble device, including ion-implanted magnetic bubble propagation tracks each being of a meandering form, magnetic bubbles being propagated along both sides of the propagation track, wherein amplitude of a meandering region in which an inplane magnetization layer is absent or thickness of said inplane magnetization layer, if present, is thinner than that of other regions is not greater than $\frac{1}{8}$ of a pitch of said meandering magnetic bubble propagation tracks,



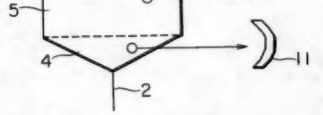
said amplitude being measured in the direction perpendicular to the direction in which bubbles are propagated.

4,589,095

MAGNETIC BUBBLE STRETCHER

Ryo Suzuki, Kodaira; Teruaki Takeuchi, Kokubunji; Masatoshi Takeshita; Naoki Kodama, both of Hachioji, and Yutaka Sugita, Tokorozawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 1, 1984, Ser. No. 636,741
Claims priority, application Japan, Aug. 3, 1983, 58-141228
Int. Cl.⁴ G11C *19/08*
U.S. Cl. 365—43 **10 Claims**



1. A magnetic bubble stretcher comprising a bubble fanning part for propagating a magnetic bubble while gradually stretching the bubble and a bubble propagation part for propagating the stretched bubble, wherein each of bubble propagation patterns included in said bubble fanning part is shaped to have substantially at least three winding points and each of bubble propagation patterns included in said bubble propagation part is shaped to have substantially one winding point.

4,589,096

IIL SEMICONDUCTOR MEMORY INCLUDING ARRANGEMENT FOR PREVENTING INFORMATION LOSS DURING READ-OUT

Kenji Kaneko, Hachioji; Takahiro Okabe, Nishitama, and Minoru Nagata, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 17, 1983, Ser. No. 476,269
Claims priority, application Japan, Mar. 17, 1982, 57-40786
Int. Cl.⁴ G11C *11/00*
U.S. Cl. 365—154 **5 Claims**

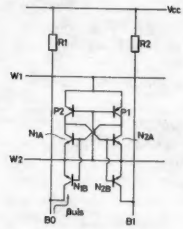
3. A semiconductor memory comprising:

memory cells each including first and second IIL unit circuits, each of which includes an emitter region of a first conductivity type, a base region of a second conductivity type formed in said emitter region, first and second collector regions of the first conductivity type formed in said base region, and an injector region of the second conductivity type formed in said emitter region and separated from said base region, and in which said first collector regions and said base regions are cross-connected to each other,

pairs of bit lines, the bit lines of each pair being respectively

connected to said second collector regions of said first and second IIL unit circuits,

an upper and a lower word line, said injector regions being



connected to said upper word line and said emitter regions being connected to said lower word line, and

means coupled to said bit lines for holding said bit lines at a higher potential than said lower word line.

4,589,097

NON-VOLATILE MEMORY CIRCUIT HAVING A COMMON WRITE AND ERASE TERMINAL

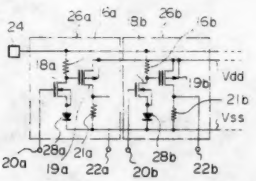
Heihachiro Ebihara, Tanashi, Japan, assignor to Citizen Watch Company Limited, Tokyo, Japan

Filed Mar. 15, 1983, Ser. No. 475,424

Claims priority, application Japan, Mar. 16, 1982, 57-41183; Apr. 27, 1982, 57-69642

Int. Cl.[4] G11C *7/00, 11/36*

U.S. Cl. 365—185 **4 Claims**



1. A non-volatile memory circuit for storing data which is input thereto as a plurality of data signals in parallel form, each data signal varying between a first and a second low potential level, comprising:

a plurality of semiconductor non-volatile memory elements each provided with a source electrode, a gate electrode and a drain electrode, with all of said source electrodes of said non-volatile memory elements being connected in common to said first low potential level;

a common control terminal coupled to receive a first high potential level when said non-volatile memory circuit is operating in a write-in mode in which said data are stored therein and to receive a second high potential level of opposite polarity to said first high potential level when said non-volatile memory circuit is operating in an erase mode in which said stored data are erased;

a plurality of first resistive elements each coupled between said common control terminal and a gate electrode of a corresponding one of said non-volatile memory elements;

a plurality of control transistors each provided with a drain electrode which is connected to a corresponding one of said gate electrodes of said non-volatile memory elements, a gate electrode which is coupled to receive a corresponding one of said data signals, and a source electrode;

a plurality of second resistive elements each connected between a corresponding one of said drain electrode of said non-volatile memory elements and said second low potential level; and

diode means connected between said source electrodes of said control transistors and said second low potential level.

4,589,098

METHOD AND APPARATUS FOR OPTICAL DATA PROCESSING

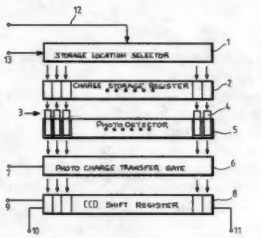
Klaus Dietrich, Gauting, Fed. Rep. of Germany, assignor to Messerschmitt-Bölkow-Blohm GmbH, Fed. Rep. of Germany

Filed May 13, 1983, Ser. No. 494,527

Claims priority, application Fed. Rep. of Germany, May 14, 1982, 3218244

Int. Cl.[4] G11C *7/00*

U.S. Cl. 365—215 **6 Claims**



1. A method for optical data processing, comprising:

modulating a source of light according to a first function;

applying values of a second function to a storage location selector which is capable of selecting a plurality of storage locations and is further capable of writing each value of the second function as a potential value into one of the storage locations;

writing the values of the second function as potential values into a plurality of storage locations of a charge memory which storage locations has addresses that are selected by the storage location selector;

applying the potential values of the storage location to a respective plurality of optical modulator elements, each obstacle modulator element having an optical property which varies according to a potential value applied thereto;

illuminating the optical modulator elements with light from the light source which is being modulated according to the first function so that light passing through and leaving each optical modulator element has an intensity which depends on the optical property of that optical modulator element and on the modulation of the light from the light source;

illuminating a photodetector having a plurality of individual photocells with the light leaving the optical modulator element, there being an equal number of photocells and modulator elements with each modulator element being connected directly to a respective photocell, each photocell being charged to an extent dependent on the light leaving a respective modulator element and illuminating the respective photocell;

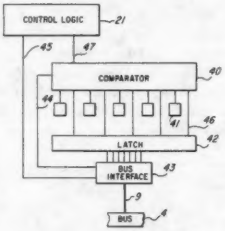
applying the photocell charges to a controlled charge transfer gate for receiving the photocell charges; and

writing the photocell charges from the controlled charge transfer gate onto individual storage locations of a CCD shift register, the photocell charges being readable from the shift register.

4,589,099
SOLID SLICE MEMORY

David S. Laffitte; William D. Hopkins, both of Houston, and John W. Hayn, II, Sugarland, all of, assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 20, 1982, Ser. No. 450,830
Int. Cl.[4] G11C *7/00*
U.S. Cl. 365—230 **6 Claims**



1. An electronic system located upon a single semiconductor substrate comprising:

a plurality of isolated integrated circuits located upon said substrate, each integrated circuit having a plurality of input/output lines;

an information bus connected to each integrated circuit via the corresponding input/output lines;

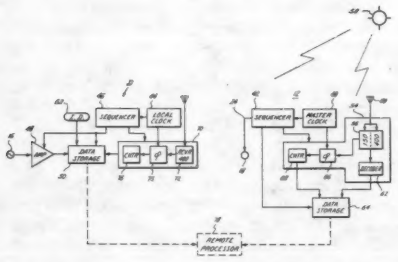
address detection means included within each integrated circuit and connected to the input/output lines of that integrated circuit, said address detection means for the detecting when an integrated circuits address corresponding to said integrated circuit is present upon said information bus and providing an enable signal thereto, said address detection means further including nonvolatile read/write memory to store said integrated circuit address; and

control circuit included within each integrated circuit connected to said address detection means to receive said enable signal and regulate the flow of information between the integrated circuit and the bus.

4,589,100
METHOD AND APPARATUS FOR POSITIONING SEISMIC ARRAYS

Carl H. Savit, Houston, Tex., assignor to Western Geophysical Company of America, Houston, Tex.

Filed Oct. 30, 1981, Ser. No. 316,596
Int. Cl.[4] G01V *1/22*
U.S. Cl. 367—77 **10 Claims**



1. In a seismic data recording system including a central station, a plurality of remote seismic data recording units designed for deployment within a desired region relative to the central station and spaced apart according to a desired grid spacing, means within each remote seismic data recording unit for recording at least one channel of seismic data, means for synchronizing seismic data recording cycles of the remote seismic data recording units with seismic signals produced under control of the central station, the improvement comprising:

means in the central station for receiving and recording electromagnetic positioning signals originating from means external to and independent of said seismic data recording system;

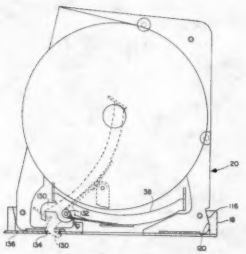
means in each said remote seismic data recording unit for receiving and utilizing only a portion of said electromagnetic positioning signals simultaneously with concurrent recording of said electromagnetic positioning signals in said central station; and

means for combining the electromagnetic positioning signal portions utilized by said remote seismic data recording units with the electromagnetic positioning signals recorded in said central station thereby to derive a differential position relative to said central station.

4,589,101
LINEAR CHANGER APPARATUS

Etienne A. M. Schatteman, Wemmel, and Philippe V. Denis, Genappe, both of Belgium, assignors to Staar S.A., Brussels, Belgium

Filed Dec. 28, 1984, Ser. No. 687,021
Claims priority, application Belgium, Jun. 1, 1984, 0/213058
Int. Cl.[4] G11B *17/28*
U.S. Cl. 369—38 **20 Claims**



1. Apparatus for recording and/or playback of recordings on discs including a selective disc changer, said apparatus comprising:

a chassis;

a playback unit including a housing for supporting a disc in operative position and having an entrance slot for receiving a disc inserted edgewise in its own plane;

a removable magazine carried on said chassis and having a plurality of disc storage compartments arranged side by side, means for mounting said magazine for movement along a path having a portion generally transverse to said plane to position said compartments successively into alignment with said plane, each of said compartments having an entrance located in a face of said magazine, different ones of said entrances being adapted to be aligned with said entrance slot;

means for transferring a disc from one of said storage compartments in said magazine into said housing of said unit through said entrance slot and for returning a disc from the housing to a storage compartment in the magazine through one of said entrances;

means for locking said magazine against being removed from said mounting means on said chassis; and

means for actuating said locking means responsive to actuation of said transferring means for transferring a disc from the magazine to ensure that the magazine is locked against removal from the time that one of the discs stored in a

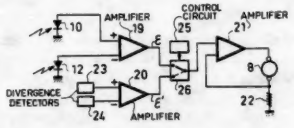
compartment of the magazine has left its storage position until it is returned to the magazine compartment.

4,589,102

DEVICE FOR COMPENSATING THE LACK OF BALANCE OF A DEVIATING MIRROR BELONGING TO AN OPTICAL SYSTEM FOR ILLUMINATING A DATA MEDIUM

Patrick Volleau; Claude Bricot; Michel Audouin; Dominique Leterme, and Jean P. Le Merer, all of Paris, France, assignors to Thomson-CSF, Paris, France

Continuation of Ser. No. 335,527, Dec. 29, 1981, abandoned. This application Jul. 20, 1984, Ser. No. 632,280
Claims priority, application France, Dec. 29, 1980, 80 27694
Int. Cl.[4] G11B *7/095*
U.S. Cl. 369—46 **6 Claims**



1. A compensation system for balancing an optical head which is used for projecting a light beam onto a data carrier which data carrier is provided with track elements with said optical head being movable in order to cause said light beam to project to a location for interaction with any one of said track elements and wherein said optical head further includes a pivotable mirror actuated by a motor and a first tracking servo loop with said mirror and said servo loop causing said light beam to remain in registration with said any one of said track elements;

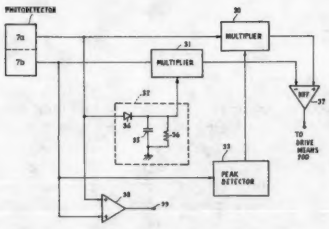
a second tracking servo loop for counteracting a tilting of said pivotable mirror which tilting takes place when said optical head is subject to acceleration wherein said second tracking servo loop comprises a means for sensing said tilting and a means for deriving a control signal which control signal is fed to the control input of said motor to thereby counteract said tilting wherein said first and second tracking servo loops are each connected to said control input of said motor by means of a changeover switch.

4,589,103

TILT COMPENSATION TRACKING CONTROL SYSTEM FOR OPTICAL DISCS

Osamu Tajima, Ayase, Japan, assignor to Victor Company of Japan, Limited, Japan

Filed Jan. 24, 1983, Ser. No. 460,561
Claims priority, application Japan, Jan. 22, 1982, 57-8304
Int. Cl.[4] G11B *7/00*
U.S. Cl. 369—46 **15 Claims**



1. A tracking control system for use with a grooveless record on which information is recorded in the form of a series of microscopic pits along parallel tracks, comprising:

a pair of first and second adjacent optoelectrical elements separated by a neutral line;

means mounted above said record in laterally movable relation to the path of said tracks in response to a tracking control signal for emitting a light beam to a surface of said record and directing light reflected off the record surface and forming a beam spot on a surface of said first and second optoelectrical elements so that when said emitted light beam has a predetermined angle of incidence on said record surface said tracking control signal is valid for following a path of a given track so that the center of said beam spot is aligned with said neutral line, and when said record tilts causing the emitted beam to deviate from said predetermined angle of incidence said tracking control signal contains false information;

a subtractor;

maximum detector means responsive to said first and second optoelectrical elements for detecting peak values of the output signals therefrom corresponding to land portions of the record to derive first and second peak value signals respectively from the first and secnd optoelectrical elements; and

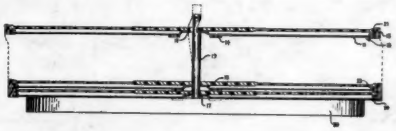
modulator means responsive to said first and second optoelectrical elements for modulating the magnitude of the output signals therefrom with said first and second peak value signals and applying the modulated signals to said subtractor to detect a difference therebetween such that said false information is nullified at the output of said subtractor.

4,589,104

SPACER/PROTECTOR FOR STACKING RECORDED 33 RPM RECORDS

Richard C. Brockley, 657 Linden Ave., York, Pa. 17404

Filed Jan. 8, 1985, Ser. No. 689,779
Int. Cl.[4] G11B *23/02*
U.S. Cl. 369—291 **4 Claims**



1. Spacing means insertible between adjacent phonograph records when in stacked relationship, said means comprising a disc-like member having a peripheral seat and spacing means around the circumference thereof, said member also having a central opening for reception of a phonograph spindle, the central portion of said member having an integral, axially displaced section formed by deforming the material of the member, said section being of limited area, projecting from one surface of said member, and adapted to receive and support the central non-recorded area of a phonograph record and prevent the record from making contact with a stacked adjacent record, turntable or underlying device and the opposite surface of said central portion of said member having a supplementary central spacing element affixed thereto for engaging the central portion of a lower record in a stack thereof or a turntable to effectively space the central portions of a plurality of stacked records.

4,589,105
FLEXIBLE DISC CASSETTE

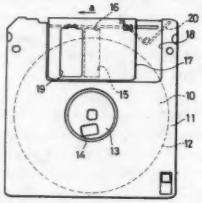
Tsuneo Nemoto, Miayagi; Osamu Koizumi, and Koukichi Sugawara, both of Miyagi, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 7, 1984, Ser. No. 607,767

Claims priority, application Japan, May 13, 1983, 58-71322[U]

Int. Cl.[4] G11B *23/02*

U.S. Cl. 369—291 **3 Claims**



1. A magnetic disc cassette comprising, a flexible magnetic disc, a casing comprising an upper shell and a lower shell for containing the flexible magnetic disc therebetween, a head access hole provided in said casing for exposing a portion of the flexible magnetic disc to permit recording and/or reproducing operation,

a shutter reciprocably mounted on one edge of said casing and selectively positionable in a closed position and an open position, said shutter including a shutter hole and said access hole being accessible through said shutter hole in said open position, a V shaped shutter spring urging said shutter toward said closed position, said V-shaped shutter spring having legs lying generally in a plane parallel to the path of movement of the shutter and each leg having an L-shaped hook formed generally perpendicular to said plane at its respective tip,

hook means provided in said shutter for engaging one of said L-shaped hooks, and a recess provided in one of said shells of said casing for confining the other of said L-shaped hooks, said recess having a guiding portion which permits the other of said L-shaped hooks to pass to said recess.

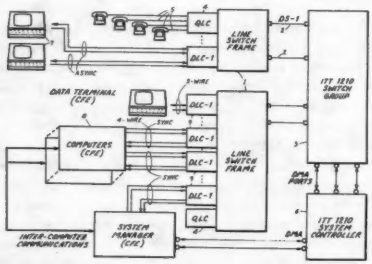
4,589,106
DATA LINE CARD PRINTED BOARD ASSEMBLY

Donald W. Prather, Raleigh, N.C., and Richard G. Sposito, Mansfield, Ohio, assignors to ITT Corporation, New York, N.Y.

Filed Aug. 20, 1984, Ser. No. 642,622

Int. Cl.[4] H04Q *11/04*

U.S. Cl. 370—58 **42 Claims**



1. A data line card printed board assembly to provide an interface between a switching system and data terminal equipment operating in a selected one of a synchronous mode, an asynchronous mode and a synchronous polled mode and at a selected one of a plurality of different data rates comprising:

first means coupled to said switching system to provide a first bidirectional communication path between said switching systems and said data line card;

second means coupled to said first means and said data terminal equipment to provide said first bidirectional communication path between a first of said data terminal equipment and said data line card;

computer means disposed on said assembly coupled to said first and second means for bidirectional control of said first and second means to accommodate said selected one of said modes and said selected one of said plurality of different data rates; and

a clock generator disposed on said assembly coupled to said first and second means responsive to a clock signal received from said switching system, wherein said first means includes

first decoder means coupled to said switching system to indicate a first time period in which data is received from said switching system for said first bidirectional communication path and transmitted to said switching system from said first bidirectional communication path,

first synchronous, asynchronous receiver and transmitter means coupled to an internal data bus, and

first interface means coupled to said switching system, said first synchronous, asynchronous receiver and transmitter means and said first decoder means under control of said first decoder to present input data from said switching system to said internal data bus and to present output data on said first bidirectional communication path from said internal data bus to said switching system.

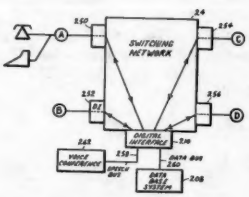
4,589,107
SIMULTANEOUS VOICE AND DATA COMMUNICATION AND DATA BASE ACCESS IN A SWITCHING SYSTEM USING A COMBINED VOICE CONFERENCE AND DATA BASE PROCESSING MODULE

Francisco A. Middleton, Sandy Hook; Santanu Das, and Nicholas J. R. Carter, both of Shelton, all of Conn., assignors to ITT Corporation, New York, N.Y.

Continuation of Ser. No. 445,625, Nov. 30, 1982, abandoned, and Ser. No. 445,626, Nov. 30, 1982, Pat. No. 4,488,287, and Ser. No. 433,335, Oct. 17, 1982, abandoned. This application Mar. 30, 1984, Ser. No. 595,087

Int. Cl.[4] H04Q *11/04*; H04M *3/00*

U.S. Cl. 370—62 **9 Claims**



1. In a combined telecommunications and data communication system for combining and splitting speech and data for transmission through a digital switching network between two or more ports, said system including, digital interface means coupled to said ports for combining digitally encoded speech and data words from speech and data buses respectively for delivery to said ports in the same channel for bidirectional transmission between said ports and for splitting speech and data received in the same channel at a port for transmission on speech and data buses, a digital switching network coupled to said digital interface means for switching and transmitting

digitally encoded speech and data simultaneously in the same channels between said ports, in combination therewith apparatus for receiving and transmitting speech and data to said ports, comprising:

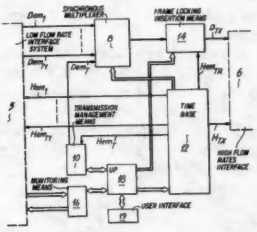
a data base means, coupled to a predetermined port of said switching network and adapted to receive from the digital interface means associated with said predetermined port data emanating from any connected port of said switching network and to transmit data via said digital interface means and its associated port, and

voice conferencing means coupled to said predetermined port of said switching network and adapted to receive from said associated digital interface means speech emanating from any connected port of said switching network and to retransmit said speech via said digital interface means and its associated port, whereby the data base means and the voice conferencing means are both connected to a single network port so that the number of network channels and ports, required for voice conferencing and data base access is minimized.

4,589,108
MULTIPLEXER, DEMULTIPLEXER AND MULTIPLEXING-DEMULTIPLEXING EQUIPMENT WITH RECONFIGURABLE FRAMES

Jean C. Billy, Prat Cottee St Quay Perros, 22700 Perros Guirec, France

Filed May 3, 1984, Ser. No. 607,118
Claims priority, application France, May 4, 1983, 83 07438
Int. Cl.[4] H04J *3/16*
U.S. Cl. 370—84 **12 Claims**



1. A reconfigurable frame multiplexer for processing frame signals and incorporating a frame locking word, data blocks and a service block comprising:

a synchronous multiplexer receiving on N inputs a number N of low flow rate channels with random flow rates and supplies a multiplexed signal on an output channel,

a frame locking word insertion means located downstream of the synchronous multiplexer,

a time base supplying clock and synchronization signals to the synchronous multiplexer and to the frame locking word insert means,

a monitoring means for monitoring the state of the low flow rate channels and the state of the reconfigurable frame multiplexer,

transmission management means applying a signal to an input of said synchronous multiplexer, said signal occupying the service block in the frame,

a microprocessor provided with a random access memory and a read-only memory connected to the monitoring means, to the frame locking word insertion means, to the time base and to the transmission management means,

a user interface connected to the microprocessor, the improvement being in that the time base comprises the combination of:

a fast time base,

two storage means, each one being able to store a frame configuration with data sent by the microprocessor, one of these storage means containing the present frame configuration, i.e. the one which is used at current time, said storage means being addressed in read-mode by the fast time base, the other storage means being addressed in write-mode by microprocessor to store a new frame configuration,

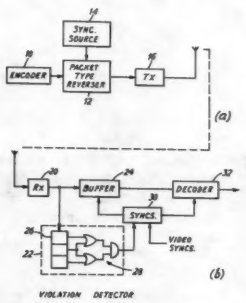
a switch with two inputs and two outputs, the microprocessor being connected to one input of said switch, the fast time base to the other input of said switch, each address port of the storage means being connected to one output of said switch, said switch also having a control input controlled by the microprocessor for switching its outputs,

processing means for processing the clock and synchronization signals, said processing means receiving at its input the content of the storage means read by the fast time base.

4,589,109
MULTIPLEXED DIGITAL DATA TRANSMISSION

John P. Chambers, Tadworth, England, assignor to British Broadcasting Corporation, London, England

Filed Apr. 13, 1984, Ser. No. 599,932
Claims priority, application United Kingdom, Apr. 15, 1983, 8310315
Int. Cl.[4] H04J *3/26*
U.S. Cl. 370—94 **5 Claims**



1. A digital multiplexer system which includes means for providing data packets containing samples which are to be synchronised with one another or with an external reference, said data packets further containing packet type indicators for distinguishing different packet types, and means for recognising the packet type indicator of a particular data packet which is inappropriate to said data packet but which is appropriate to another type of data packet so as to identify said particular data packet.

4,589,110
SIGNAL PROCESSOR (SYSTEM) FOR REDUCING BANDWIDTH AND FOR MULTIPLEXING A PLURALITY OF SIGNALS ONTO A SINGLE COMMUNICATIONS LINK

Kai Y. Eng, Middletown, and Barin G. Haskell, Tinton Falls, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

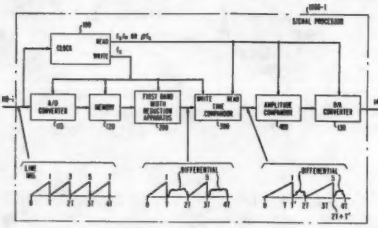
Continuation-in-part of Ser. No. 457,289, Jan. 12, 1983, abandoned, which is a continuation of Ser. No. 276,876, Jun. 24, 1981, abandoned. This application Sep. 19, 1984, Ser. No. 652,741
Int. Cl.[4] H04J *3/18*; H04N *7/12*
U.S. Cl. 370—118 **12 Claims**

1. A signal processor including an input terminal adapted to receive a regularly occurring signal, said regularly occurring signal having a sequence of prefixed time intervals, means for processing said regularly occurring signal and means for ex-

tending said processed signal to an output terminal, and characterized in that said processing means further comprises:

means for reducing the bandwidth of said regularly occurring signal, said reducing means including:

(a) means for time expanding the time interval of a signal appearing in one of said time intervals;



(b) means for time compressing the time interval of a signal appearing in a different one of said time intervals; and

(c) means for providing said time expanded signal and said time compressed signal as said processed signal.

4,589,111

ARQ EQUIPPED DATA COMMUNICATION SYSTEM

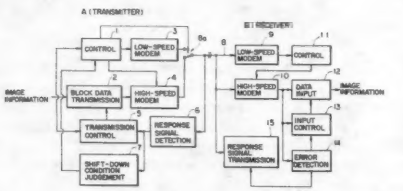
Eiichi Adachi, Atsugi, Japan, assignor to Ricoh Company, Ltd.

Filed Jun. 14, 1983, Ser. No. 504,212

Claims priority, application Japan, Jun. 14, 1982, 57-101596

Int. Cl.[4] G08C *25/02*; G06F *11/10*

U.S. Cl. 371—32 **6 Claims**



1. A data communication system comprising:

a transmitter for transmitting data at a variable MODEM rate;

a receiver for receiving said data transmitted from said transmitter at a variable MODEM rate;

a transmission line connecting said transmitter to said receiver;

means for retransmitting at least a part of said data from said transmitter to said receiver at a second MODEM rate when the number of trails of retransmission of said at least a part of said data at a first MODEM rate has reached a first predetermined number; and

means for supplying said first predetermined number from said receiver to said transmitter prior to transmission of said at least a part of said data from said transmitter to said receiver thereby allowing to set said first predetermined number varyingly depending on said receiver connected to said transmitter for communication of said data through said transmission line.

4,589,112

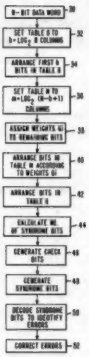
SYSTEM FOR MULTIPLE ERROR DETECTION WITH SINGLE AND DOUBLE BIT ERROR CORRECTION

Faraydon O. Karim, Vestal, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 26, 1984, Ser. No. 574,221

Int. Cl.[4] G06F *11/10*

U.S. Cl. 371—37 **5 Claims**



1. A method for detecting multiple errors that occur during transfer of a data message having a plurality of data bits and for correcting up to two of said errors, the steps comprising:

(a) calculating a number of check bits associated with said data message;

(b) grouping all data bits in a data message into base groups and multiple layer groups, the sum of the number of base groups and the number of multiple layer groups of data bits being equal to said number of check bits;

(c) assigning up to two weights for each data bit;

(d) distributing data bits among said groups according to weights assigned thereto;

(e) generating a check bit for each of said groups the total number of generated check bits being equal to the number calculated in step (a);

(f) padding said data message with said total number of generated check bits to form an appended data message;

(g) generating a predetermined number of syndrome bits, said predetermined number being equal to said number of check bits; and

(h) decoding said syndrome bits to identify the erroneous bits in said data message.

4,589,113

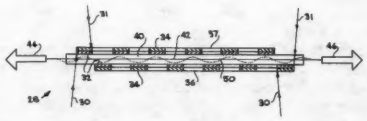
SHORT WAVELENGTH LASER

Peter L. Hagelstein, Livermore, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 25, 1984, Ser. No. 623,876

Int. Cl.[4] H01S *3/30*

U.S. Cl. 372—5 **8 Claims**



1. A method, for providing an electron collisionally-excited single pass amplified spontaneous emission short wavelength laser gain medium that laser amplifies 3p-3s transition EUV or

soft X-ray radiation along an approximately linear path, the method comprising the step of:

producing a multiplicity of plasmas arrayed in two separated and alternately staggered parallel arrays disposed along said approximately linear path, with each said plasma having an approximately exponential decaying electron density gradient extending perpendicularly inward toward said approximately linear path.

4,589,114

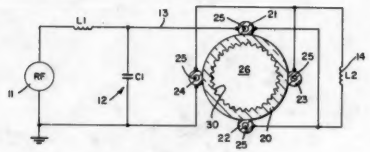
OPTICAL MODE CONTROL FOR A GAS LASER

Leroy V. Sutter, Jr., 44 Rocky Knoll, Irvine, Calif. 92714

Filed Jun. 19, 1984, Ser. No. 622,093

Int. Cl.[4] H01S *3/098*

U.S. Cl. 372—19 **3 Claims**



1. An improved gas laser comprising:

a. an elongated cylindrical chamber of cross-sectional dimension which has an internal cylindrical wall and which is suitable for confining a laser gas discharge wherein said internal cylindrical wall has a plurality of grooves on its internal wall surface which absorbs any light energy which is being reflected by the internal wall surface;

b. a laser gas disposed in said elongated cylindrical chamber;

c. first and second electrode means for exciting said laser gas;

d. energy means for applying a voltage between said first and second electrode means in order to establish a laser gas discharge in said laser gas; and

e. first and second reflecting means for reflecting light energy from said laser gas discharge within said elongated cylindrical chamber so that said light energy travels longitudinally the length of said elongated cylindrical chamber and is optically independent of the internal walls of said elongated cylindrical chamber whereby said plurality of grooves absorbs any light energy which is not being reflected by said first and second reflecting means in order to provide optical mode control.

4,589,115

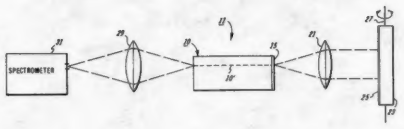
WAVELENGTH TUNING OF QUANTUM WELL HETEROSTRUCTURE LASERS USING AN EXTERNAL GRATING

Robert Burnham, Palo Alto, Calif.; Nick Holonyak, Jr., Urbana, Ill., and Harlan F. Chung, Daly City, Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 9, 1983, Ser. No. 530,555

Int. Cl.[4] H01S *3/101*

U.S. Cl. 372—20 **17 Claims**



1. Apparatus for selective tuning the emission wavelength of a semiconductor laser comprising a semiconductor injection laser having an optical cavity for radiation generation and propagation under lasing conditions, an anti-reflection means on one facet of said laser, a rotatable diffraction grating positioned to be in alignment with the output emission spectra from said one facet, means to image the output emission spectra from said one facet onto said grating, said grating rotated to select the desired operating wavelength within the emission spectra of said laser, said apparatus characterized in that said laser contains a quantum well structure capable of exhibiting quantum size effects comprising more than one energy band state, the rotation of said grating effective to select one of a possible number of wavelengths represented by the spectra emission between said bands as well as through each of said bands.

4,589,116

LASER DIODE WITH UNIFORM MECHANICAL STRESS AND/OR HEAT DISSIPATION

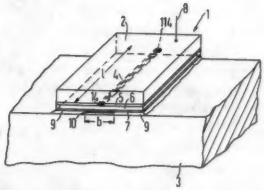
Heinz Westermeier, Neubiberg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 23, 1984, Ser. No. 633,598

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1983, 3329107

Int. Cl.[4] H01S *3/04*

U.S. Cl. 372—36 **12 Claims**



1. A laser diode, comprising:

a semiconductor substrate in which a strip-shaped laser active zone is provided near its upside;

the substrate being assembled in upside-down-technology on a heat sink with the laser active zone at a bottom side of the substrate and a metal contact layer being positioned between the heat sink and the substrate in a proximity of the laser-active zone;

a solder layer between said metal contact layer and said heat sink with which the substrate and the heat sink are interconnected in fixed manner;

between a portion of the contact layer and a portion of the solder layer an additional layer comprised of a material which substantially prevents alloy formation between the metal of the contact layer and the solder; and

said additional layer extending over an entire length of the laser-active zone and having a width which corresponds at least to a width of a waveguide region of the laser-active zone.

4,589,117

BUTT-JOINTED BUILT-IN SEMICONDUCTOR LASER

Katsuyuki Utaka, Musashino; Kazuo Sakai; Shigeyuki Akiba, both of Tokyo, and Yuichi Matsushima, Tokorozawa, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 9, 1983, Ser. No. 502,589

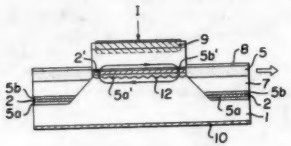
Claims priority, application Japan, Jun. 10, 1982, 57-98495

Int. Cl.[4] H01S *3/19*

U.S. Cl. 372—50 **3 Claims**

1. A butt-jointed built-in semiconductor laser comprising: a semiconductor substrate having a mesa-shaped stepped portion extending perpendicularly to the direction of an optical axis of the semiconductor laser and having a predetermined width so that a recessed portion is provided adjacent said mesa-shaped stepped portion; a first semiconductor layer formed on said

recessed portion and on top of said mesa-shaped stepped portion of said semiconductor substrate, said first semiconductor layer being discontinuous between the top of said mesa stepped portion and said recessed portion, said first semiconductor layer serving as an active layer in a resonant cavity including the same; a second semiconductor layer of a material reverse in conductivity type from said substrate and larger in energy gap but smaller in refractive index than said first semiconductor layer and formed on top of said first semiconductor layer on said recessed portion and said mesa-shaped portion, said second layer being discontinuous between the top of said mesa-shaped portion and said recessed portion and of a thickness such that said second semiconductor layer on said recessed portion is not in contact with said first semiconductor layer



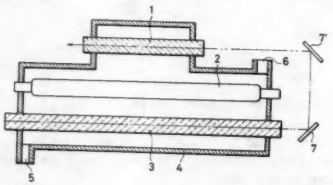
formed on the mesa-shaped stepped portion; a third semiconductor layer of a material having an energy gap and a refractive index intermediate between those of said first and second semiconductor layers and formed on said semiconductor layer to such a thickness that said third semiconductor layer formed on said recessed portion extends at least to the top of said first semiconductor layer formed on said mesa-shaped stepped portion; a fourth semiconductor layer of a material larger in energy gap but smaller in refractive index than said third semiconductor layer and formed on said third semiconductor layer on said mesa-shaped stepped portion and said recessed portion; and a pair of electrodes provided on surfaces of said substrate and said fourth semiconductor layer in opposing relation to each other across said semiconductor layer on said mesa-shaped stepped portion.

4,589,118

METHOD OF OPTICAL PUMPING OF ERBIUM-DOPED LASER MATERIAL AND APPARATUS THEREFOR

Teiichi Suzuki, and Tetsuro Izumitani, both of Tokyo, Japan, assignors to Hoya Corporation, Tokyo, Japan

Filed Mar. 8, 1985, Ser. No. 709,816
Claims priority, application Japan, Mar. 9, 1984, 59-43790
Int. Cl.[4] H01S *3/091*
U.S. Cl. 372—71 **4 Claims**



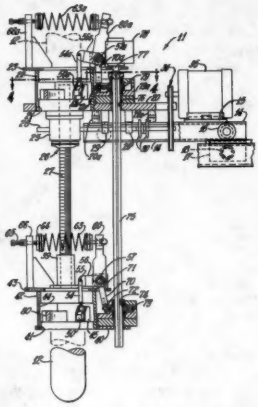
1. A method of optical pumping of an erbium laser medium which comprises side-pumping an erbium laser medium by means of excitation by a light source while at the same time end-pumping the erbium laser medium with a laser beam from a neodymium laser medium, said laser beam being emitted by optical pumping of the neodymium laser medium with said light source.

4,589,119

ELECTRODE SUPPORT MECHANISM AND METHOD

Charles S. Dunn, Patuskala, and Stephen Seng, Frazeysburg, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation-in-part of Ser. No. 342,870, Jan. 26, 1982, Pat. No. 4,422,172. This application Dec. 16, 1983, Ser. No. 561,863
Int. Cl.[4] H05B *7/10*
U.S. Cl. 373—94 **2 Claims**



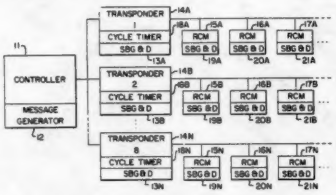
1. An electrode support for an arc-type furnace comprising a fixed upper support plate having a generally cylindrical upper electrode-receiving passage, a lower support plate underlying the upper support plate and having a vertical electrode-receiving passage therethrough a vertical registry with the passage of said upper support, means adjustably suspending said lower support plate from said upper support plate for vertical movement relative to said upper support plate, an electrode-engaging retaining means carried by said upper and lower support plate, respectively, and projecting into said passages for engagement with an electrode positioned in said apertures, respectively, means for alternately engaging said electrode-engaging means with said electrode to support said electrode from either support plate, and a linearly movable support carriage carrying said upper support plate and alternately positionable in an operative position overlying the furnace and a retracted non-operative maintenance position.

4,589,120

UNIQUE START BIT FOR DATA TRANSMISSIONS

John M. Mendala, Arlington Heights, Ill., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 13, 1983, Ser. No. 561,003
Int. Cl.[4] H04L *25/38, 5/24*
U.S. Cl. 375—117 **10 Claims**



1. A data transmission system wherein a start bit denoting the beginning of a message has a non-integral length as com-

pared to a data bit time period in said message, the system comprising:

central controller means for transmitting and receiving messages;

remote control module means for transmitting and receiving messages;

communication means connecting said central controller means to said remote control module means for carrying said messages between said central controller means and said remote control module means,

said central controller means and each of said remote control module means each comprising

means for generating a start bit at the beginning of a message having a non-integral time duration as compared to a time period allotted for a data bit, and,

detection means for distinguishing the start bit from data bits.

4,589,121

DENTAL PANORAMIC X-RAY PHOTOGRAPHING APPARATUS

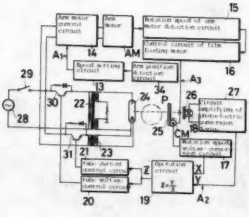
Takao Makino, Otsu, Japan, assignor to Kabushiki Kaisha Morita Seisakusho, Kyoto, Japan

Filed Jan. 25, 1985, Ser. No. 695,099

Claims priority, application Japan, Feb. 1, 1984, 59-17895

Int. Cl.⁴ G03B *41/16;* H05G *1/32*

U.S. Cl. 378—39 **2 Claims**



1. A dental panoramic X-ray photographing apparatus including a rotary arm having an X-ray generator disposed at one end thereof and having an X-ray film cassette holder disposed at the other end thereof in an opposite relation with each other around an object disposed therebetween, said apparatus being characterized in that it comprises a first control means for controlling the rotation speed of said arm by detecting the rotation position of said arm and a second control means for controlling the tube voltage and the tube current of said X-ray generator by comparing the feeding speed of said X-ray film at said X-ray film cassette holder with the residual X-ray dose which has passed said object and said X-ray film.

4,589,122

PANORAMIC TOMOGRAPHY X-RAY APPARATUS

Timo Nieminen, Helsinki, Finland, assignor to Instrumentarium Corp., Finland

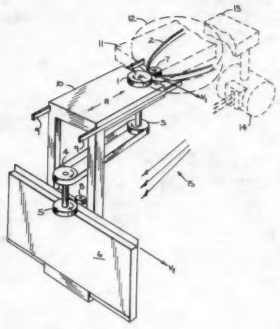
Filed Sep. 20, 1984, Ser. No. 652,526

Claims priority, application Finland, Oct. 14, 1983, 833754

Int. Cl.⁴ A61B *6/14*

U.S. Cl. 378—39 **3 Claims**

1. A beam panoramic tomography X-ray apparatus, for imaging the teeth and jaw area of a patient, wherein an X-ray source **(14)** and an image recording layer **(6)**, are by means of an arm member **(13)** connected to each other on opposite sides of said area to be imaged for rotation around said area to be imaged, said apparatus comprising means **(1, 2, 7, 9, 10)** for moving said image recording layer during the imaging in the direction parallel to a beam of X-rays **(15)** in a manner such that the distance of said image recording layer from a layer to be imaged remains substantially unchanged, as well as means **(1–5)** for shifting said image recording layer during the imaging in the direction perpendicular to said beam of X-rays **(15)** at a rate of speed which, by the ratio of magnification, exceeds the rate of speed of the intersection between a projecting beam of X-rays **(15)** and a surface or layer to be imaged, characterized in that said apparatus comprises a guide profile **(2)**, having the same configuration as a layer to be imaged and being stationary relative to a patient during the imaging, and an image recording layer **(6)** shifting mechanism **(1 . . . 5, 7 . . . 10)** having means for following said guide profile **(2)** during imaging, the movement of said image recording layer **(6)** in the direction of said beam of X-rays **(15)** being achieved by moving said image recording layer in a manner such that the distance between the image recording layer **(6)** and X-ray source **(14)** changes.



4,589,123

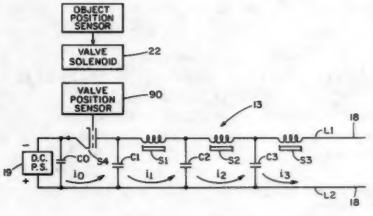
SYSTEM FOR GENERATING SOFT X RAYS

Jay S. Pearlman, San Diego; John C. Riordan, Carlsbad, and Vance I. Valencia, San Diego, all of Calif., assignors to Maxwell Laboratories, Inc., San Diego, Calif.

Filed Feb. 27, 1985, Ser. No. 705,969

Int. Cl.⁴ H05G *1/22;* H01J *7/24;* G21B *1/00;* G21K *5/00*

U.S. Cl. 378—106 **7 Claims**



1. A system for generating soft X rays comprising:

valve apparatus for repetitively providing bursts of gas of brief duration;

a magnetic pulse compression power supply for providing high current pulses;

a transmission line connected to said power supply for transmitting power pulses from said supply through said bursts of gas, said power supply including a plurality of series saturable inductor magnetic switches and a plurality of shunt capacitors; and

means for synchronizing operation of said valve apparatus and said power supply, whereby upon synchronized provision of a burst of gas from said valve apparatus and a power pulse from said power supply, a high current discharge generates plasma and an intense magnetic field which radially compresses the plasma resulting in a dense,

high temperature plasma which is an intense source of soft X rays.

4,589,124

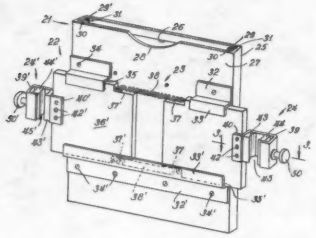
X-RAY FILM HOLDER FOR PATIENT IN WHEELCHAIR

Gilbert G. Ruiz, 2614 N. Sterling Dr., McHenry, Ill. 60050

Filed May 18, 1984, Ser. No. 611,992

Int. Cl.[4] G03B *42/02*; A61B *6/08*; H05G *1/00*; A47C *7/62*

U.S. Cl. 378—178 **9 Claims**



1. A wheelchair comprising a supporting frame having frame members supportively associating with a chair means, said frame being mounted on wheels, and said frame including spaced-apart frame members arranged adjacent said chair means, in combination, a portable X-ray film cassette holder detachably mounted with said spaced-apart frame members, said holder comprising retaining means for removably retaining an X-ray film cassette adjacent said chair means, said retaining means supportably associating with means for mounting said holder to said frame members, said mounting means including adjustable spacing means carrying opposing frame-engageable locking means, and said spacing means being capable of varying the distance between the locking means, said locking means having frame member receiving portions and means for releasably clamping frame members at said receiving portions whereby said holder is detachably mounted to said wheelchair and said mounting means provides adjustability enabling the use of said holder with frame members having different sizes and different spacings therebetween, and whereby said holder enables X-ray photography of a patient to be achieved whilst the patient is stationed in the wheelchair.

4,589,125

CASSETTE FOR PHOTOSENSITIVE MATERIAL WITH MAGNETIC MEMBERS

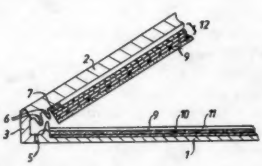
Manfred Schmidt, Kirchheim, Fed. Rep. of Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 10, 1983, Ser. No. 522,114

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1982, 3230288

Int. Cl.[4] G03B *42/04*

U.S. Cl. 378—187 **14 Claims**



1. A cassette for photosensitive material, particularly X-ray film, comprising:

(a) a pair of cooperating members movable between an open position, and a closed position in which said members define a closed compartment for photosensitive material, one of said members constituting a bottom and the other of said members constituting a cover of said cassette;

(b) a pair of sheet-like intensifying elements each including a carrier material and an intensifying material;

(c) a pair of sheet-like magnetic elements arranged to sandwich said intensifying elements in said closed position, at least one of said magnetic elements being elastically deformable, and said one magnetic element and one of said intensifying elements being mounted on one of said members, the other magnetic element and the other intensifying element being mounted on the other member, and said magnetic elements being designed to generate a magnetic force in said closed position which is sufficient to urge said intensifying elements into substantially full contact with photosensitive material sandwiched between the same; and

(d) a sheet-like compensating element mounted on said one magnetic element and having a coefficient of thermal expansion which at least approximates that of the carrier material of said one intensifying element.

4,589,126

RADIOTHERAPY TREATMENT TABLE

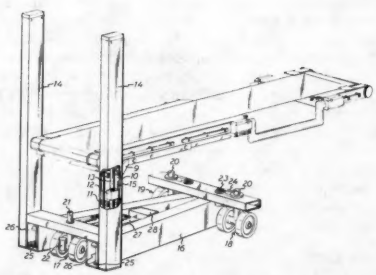
Nils E. Augustsson, Fasanvägen 2, S-232 00 Åkarp; Kjell O. T. Lindström, N. Skogsvägen 3, S-236 00 Höllviksnäs, and Lars J. S. Mattsson, Persikevägen 43, S-223 55 Lund, all of Sweden

Filed Jan. 22, 1985, Ser. No. 693,059

Claims priority, application Sweden, Jan. 26, 1984, 8400414

Int. Cl.[4] A61B *6/04*

U.S. Cl. 378—209 **11 Claims**

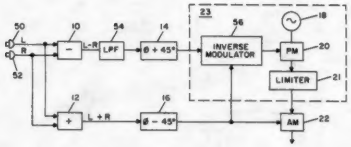


1. A radiotherapy treatment table which has a vertically movable patient supporting plane mounted on a frame and adapted to support and position the patient during treatment, characterized in that the patient supporting plane is mounted at one end on a column on a mobile wheeled frame for the table, and at its other end is freely suspended, the column comprising a lifting device for raising and lowering of the patient supporting plane; that all the wheels of the wheeled frame are mounted on wheel holders rotatable relative to the wheeled frame and are motor-driven; and that the table has a positioning and steering device which senses the position of the treatment table relative to a radiotherapy station and drives and steers the table, in response to a measured actual position, into a desired position.

4,589,127
INDEPENDENT SIDEBAND AM MULTIPHONIC SYSTEM

Bernard D. Loughlin, Centerport, N.Y., assignor to Hazeltine Corporation, Commack, N.Y.

Filed Jun. 5, 1978, Ser. No. 912,281
Int. Cl.[4] H04H *5/00*
U.S. Cl. 381—16 **2 Claims**



1. An improved ISB AM multiphonic system transmitter, comprising:

means for supplying a pair of audio frequency signals, L and R, representative of left and right multiphonic information, respectively;

means responsive to said L and R signals, for developing therefrom sum and difference signals having components of said L and R signals of selected amplitudes and phases combined in a predetermined manner, said sum and difference signals having a relative phase difference of approximately 90° over a substantial portion of the frequency band that is common to said signals;

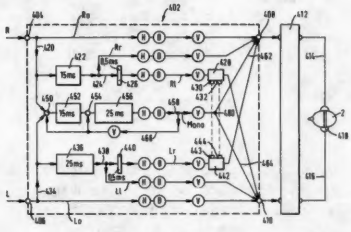
means for developing a phase modulated carrier signal, the modulation of which represents said difference signal inversely modulated by said sum signal in accordance with a modulation function of the form $(1+m_1x)/(1+x)$;

and means for amplitude modulating said phase modulated carrier signal by said sum signal to form a composite ISB AM multiphonic signal having low intermodulation distortion.

4,589,128
PROCESS FOR THE PRODUCTION OF A SOUND RECORDING AND A DEVICE FOR CARRYING OUT THE PROCESS

Peter M. Pfleiderer, Munich, Fed. Rep. of Germany, assignor to Boeters, Bauer & Partner, Fed. Rep. of Germany

Continuation of Ser. No. 260,938, May 6, 1981. This application Aug. 3, 1983, Ser. No. 519,990
Claims priority, application Fed. Rep. of Germany, May 9, 1980, 3017854; Mar. 31, 1981, 3112874
Int. Cl.[4] H04R *5/04*
U.S. Cl. 381—17 **2 Claims**

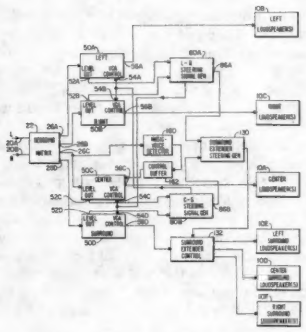


1. A process for the reproduction of a sound recording using headphones as the reproduction device, comprising connecting between the sound carrier and the reproduction device a reverberation reproducer, producing reverberation reflections within a period of approximately 50 ms, at least some of which if triggered by pulses occurring simultaneously in both channels of the sound carrier are delivered at time intervals from each other so that they are perceived by the listener as sound-intense single reflections by themselves, triggering at least some of the single reflections consisting of two pulses by a direct sound pulse from a channel of the sound carrier and of which two pulses the first is emitted over the channel of the reproduction devices that is assigned to the corresponding sound carrier channel and the second is somewhat weaker and is emitted over the other channel of the reproduction devices with a time delay with respect to the first pulse of approximately 0.2 to 1 ms the reverberation reflections are damped in dependence upon the sound frequency, the production of a mono-single reflection being effected by both input terminals **(404, 406)** being connected to a common first delay device **(452, 456)** whose output is connected, by frequency-dependent damping filters (H, B, V), a line branch **(460)** and adding elements (node amplifiers **408, 410**), to both output terminals **(408, 410)**, and whose delay is greater than the respective delay of at least two first delay devices **(422, 436)** which participate in the production of single reflections consisting of two time-separated pulses.

4,589,129
SIGNAL DECODING SYSTEM

David E. Blackmer, Wilton, N.H., and James H. Townsend, Jr., Cambridge, Mass., assignors to Kintek, Inc., Waltham, Mass.

Filed Feb. 21, 1984, Ser. No. 581,660
Int. Cl.[4] H04R *5/00*
U.S. Cl. 381—21 **12 Claims**



1. A signal decoding system for generating at least four electrical information signals in response to two input signals for respectively driving at least four loudspeakers adapted to be positioned at different locations with respect to a listener, said signal decoding system comprising:

means responsive to said input signals for generating said four electrical information signals each with select audio data for repsectively driving said loudspeakers as a function of the position of the respective loudspeaker relative to the listener;

at least four electrical transmission paths for respectively transmitting the four information signals to and driving the corresponding ones of said loudspeakers;

means disposed in each of said transmission paths for impressing a signal gain on at least a portion of the information signal transmitted over each said path as a function of a corresponding control signal generated for said path; and

means coupled to each of said transmission paths for detecting the signal level of the portion of the information signal transmitted over each said path and for generating the corresponding control signal for each said path in response to and as a function of (a) at least a part of the detected portion of the information signal for said path

and (b) the difference between at least a part of the detected portion of each of at least two other information signals transmitted over two other of said paths.

4,589,130

MULTIRATE DIGITAL TRANSMISSION METHOD AND DEVICE FOR IMPLEMENTING SAID METHOD

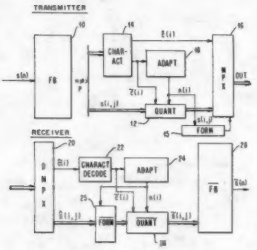
Claude Galand, Cagnes, France, assignor to International Business Machines Corp., Armonk, N.Y.

Filed Jan. 18, 1983, Ser. No. 458,796

Claims priority, application European Pat. Off., Feb. 9, 1982, 82430003

Int. Cl.[4] G10L *1/00*

U.S. Cl. 381—31 **7 Claims**



1. A method for digitally coding an electric signal for subsequent transmission at one of a plurality of different rates and in which said signal is sampled at a predetermined frequency and sub-band coded by dynamically allocating the coding bits to the sub-bands, the coding rate for all sub-bands being selected to conform to the highest rate in a set of predetermined rates, said method including the steps of:

generating a macro-sample frame format for regrouping the bits obtained by coding all samples taken in all the sub-bands during the same sampling instant, said frame format being divided in a number of fields corresponding to the number of different bit rates in the set of bit rates;

generating for each sampling instant a multi-rate macro-sample by distributing amongst said fields the bits obtained by coding each sample in the said macro-sample, according to the weight of the said bits and their distribution among the sub-bands, with reference to each of said rates in the said set; and,

adjusting the signaling rate by truncating the said multi-rate macro-sample by dropping predetermined fields as a function of the selected bit rate.

4,589,131

VOICED/UNVOICED DECISION USING SEQUENTIAL DECISIONS

Stephan Horvath, and Yung-Shain Wu, both of Zürich, Switzerland, assignors to Gretag Aktiengesellschaft, Regensdorf, Switzerland

Filed Sep. 23, 1982, Ser. No. 421,883

Claims priority, application Switzerland, Sep. 24, 1981, 6167/81

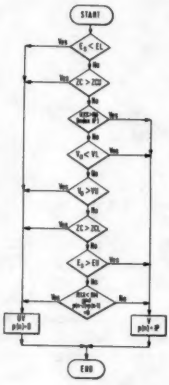
Int. Cl.[4] G10L *1/00*

U.S. Cl. 381—38 **33 Claims**

1. In a linear speech processing system wherein a digitized speech signal is divided into sections and each section is analyzed to determine the parameters of the speech model filter, a volume parameter and a pitch parameter, a method for deciding whether the speech signal represents voiced speech or unvoiced speech, said pitch parameter being set equal to zero in the case of unvoiced speech, comprising the steps of:

evaluating the speech signal or a signal derived from the speech signal relative to a first threshold criterion, the threshold value of said criterion being such that satisfaction of the criterion results in a substantially unambiguous decision that the signal represents one of voiced speech or unvoiced speech with the probability of certainty of at least 97%; and

evaluating the speech signal or a signal derived from the speech signal relative to a second different threshold criterion when said first criterion is not satisfied, the



threshold value of said second criterion being such that satisfaction of the criterion results in a substantially unambiguous decision that the speech represents one of voiced speech or unvoiced speech with a probability of certainty of at least 97%; and

evaluating the speech signal or a signal derived from the speech signal relative to a further, different criterion when said second criterion is not satisfied.

4,589,132

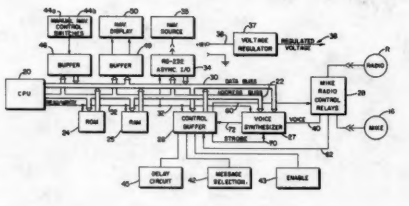
EMERGENCY SYNTHESIZED VOICE GENERATOR METHOD AND APPARATUS

Joseph M. Botbol, 9 Inkberry La., and Gerald I. Evenden, 56 Pebble La., both of North Falmouth, Mass. 02556

Filed Sep. 13, 1982, Ser. No. 417,509

Int. Cl.[4] G10L *1/00*

U.S. Cl. 381—51 **10 Claims**



1. In an emergency message generator system wherein a host two-way radio communication device has a transmit and receive mode for the transmission and reception, respectively, of voice messages, the improvement comprising:

a memory device having at least one pre-encoded message permanently stored therein;

voice generator means for converting each pre-encoded message into electrical analog voice signals whereby to simulate the human voice at the audible signal level of a microphone;

means for extracting each said message from said memory

and repetitively transmitting said message extracted at spaced time intervals to said voice generator means; and

relay control circuit means interconnecting said voice generator means and said host communication device being responsive to transmission of said message by said extracting means to said voice generator means to place said communication device in the transmit mode for broadcasting of said voice signals from said voice generator means, said relay control circuit means including control means operative to automatically convert said host communication device to the "receive" mode for the reception of messages from an external source during the spaced time intervals between the transmission of said voice signals, whereby messages are transmitted and received automatically while said communication device remains unattended, and a manually operable microphone to override the transmission of voice signals from said voice generator means for the transmission of human voice messages and to automatically convert said communication device to the receive mode for reception of messages from an external source after the transmission of each human voice message.

4,589,133

ATTENUATION OF SOUND WAVES

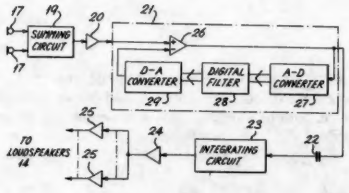
Malcolm A. Swinbanks, Pentlands Close, England, assignor to National Research Development Corp., London, England

Filed Jun. 14, 1984, Ser. No. 620,751

Claims priority, application United Kingdom, Jun. 23, 1983, 8317086

Int. Cl.[4] F01N *1/06*

U.S. Cl. 381—71 **11 Claims**



1. An active sound control system comprising a sound detection system arranged to be responsive to an unwanted sound wave which it is desired to attenuate,

a sound generating system which couples acoustically with the detection system, and

control means for operating the generating system in response to a signal derived from the detection system so as to generate a cancelling sound wave which interferes destructively with the unwanted wave in a selected spatial region,

wherein the control means incorporates a signal processing system via which the signal derived from the detection system is fed to the generating system,

the signal processing system comprising a forward signal-translating component having a gain factor which is of constant value G at least over a given frequency range and a negative feedback loop having a transfer function substantially of the form $(D_s+1F/-1/G)$, wherein D_s represents the transfer function from the output to the input of the signal processing system via said acoustic coupling, and F represents a transfer function the characteristics of which match those of a notional bandpass filter first having a pass band over the given frequency range, and secondly would substantially supress unwanted sound independently, if said acoustic coupling did not exist, in the selected region over the given frequency range.

4,589,134

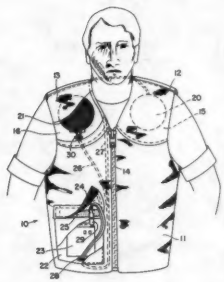
PERSONAL SOUND SYSTEM

Michael J. Waldron, 76 Black Rock Rd., Yardley, Pa. 19067

Filed Nov. 21, 1983, Ser. No. 553,649

Int. Cl.[4] H04R *1/02, 5/00*

U.S. Cl. 381—90 **1 Claim**



1. A personal sound system, comprising:

a garment adapted to substantially entirely cover a person's upper torso, said garment having portions encircling the person's neck and depending forwardly and rearwardly from the person's right and left shoulders.

a pair of fabric pockets located in said forwardly depending portions of said garment adjacent to the person's neck and shoulders,

a releasable closure extending along upper portions of each pocket,

a third pocket in said garment below said pair of pockets,

flexible wires sewn into said garment and extending between said third pocket and said pair of pockets, said wires having opposite end portions extending into each of said pockets,

releasable connectors mounted on said end portions of said wires,

a speaker adapted to be contained in each of said pair of pockets and having connectors releasably connected to corresponding ones of said releasable connectors, and

signal producing means adapted to be contained within said third pocket and having a connector releasably connected to a corresponding one of said releasable connectors,

whereby the garment provides warmth for the torso and the signal producing means cooperates with the wires to cause sound to be emitted from the speakers adjacent the person's ears while the releasable connectors afford ready removal of the speakers and signal producing means for cleaning the garment.

4,589,135

ZERO PHASE SHIFT FILTERING

Edward B. Baker, 1557 Nottingham Dr., Winter Park, Fla. 32792

Filed Feb. 14, 1984, Ser. No. 580,030

Int. Cl.[4] H03G *5/00*

U.S. Cl. 381—100 **23 Claims**

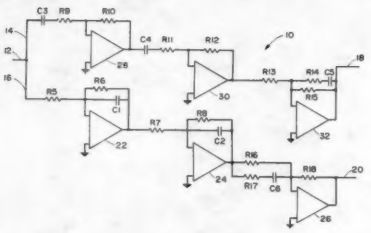
1. A frequency band dividing filter circuit comprising:

(a) a signal input lead that branches into two separate band pass filter circuits;

(b) a low-pass filter means within one of said separate band pass filter circuits wherein said low-pass filter means is characterized by a transfer function; and

(c) a high-pass filter means within said other separate band pass filter circuits wherein said high-pass filter means is characterized by a transfer function that sums with said transfer function characteristic of said low-pass filter means such that the sum is unity, and wherein said transfer

functions of said low-pass and high-pass filter means are characterized by fractions wherein the denominator of said fractions is a polynomial function of frequency of the order of three or greater and wherein the numerator of the



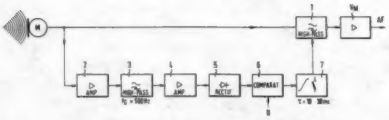
fraction characteristic of the transfer function of said low-pass filter means is a polynomial function of frequency of an order at least two less than said polynomial of the denominator, but greater than zero.

4,589,136

CIRCUIT FOR SUPPRESSING AMPLITUDE PEAKS CAUSED BY STOP CONSONANTS IN AN ELECTROACOUSTIC TRANSMISSION SYSTEM

Carlo Poldy, and Gebhard Hopfmüller, both of Vienna, Austria, assignors to AKG Akustische u.Kino-Geräte GmbH, Austria

Filed Dec. 20, 1984, Ser. No. 684,025
Claims priority, application Austria, Dec. 22, 1983, 4486/83
Int. Cl.[4] H04R *25/00*
U.S. Cl. 381—94 **15 Claims**



1. An apparatus for suppressing amplitude peaks in an electroacoustic transmission system having a transmission path with a microphone therein, which peaks are caused by stop consonants being sounded into the microphone, there being a characteristic pause before each peak, comprising:

a high-pass filter connected to the microphone in the transmission path for receiving an audio signal from the microphone;

an electronic switch associated with the high-pass filter and activatable to cause the high-pass filter to pass only high frequency portions of the audio signal from the microphone, said electronic switch having a control port for receiving an activating signal, said electronic switch having a self-locking time for continuing the activation of said high-pass filter which is sufficiently long to suppress an amplitude peak of a stop consonant; and

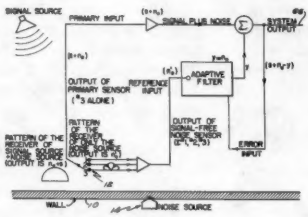
circuit means connected to said microphone and to said electronic switch control port for generating the activating signal as a function of the audio signal from the microphone.

4,589,137

ELECTRONIC NOISE-REDUCING SYSTEM

Harry B. Miller, Niantic, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 3, 1985, Ser. No. 688,662
Int. Cl.[4] H04R *27/00*
U.S. Cl. 381—94 **7 Claims**



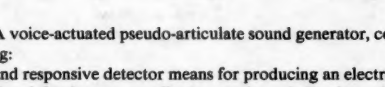
1. An electronic noise-reducing system utilizing an adaptive filter fed by at least two sensors, namely a directional reference sensor comprising at least two electroacoustic elements, and an omnidirectional primary sensor, wherein at least one electroacoustic element of the reference sensor is used both in the reference sensor and simultaneously in the primary sensor.

4,589,138

METHOD AND APPARATUS FOR VOICE EMULATION

Ronald E. Milner, Grass Valley, and Nolan K. Bushnell, Woodside, both of Calif., assignors to Axlon, Incorporated, Sunnyvale, Calif.

Filed Apr. 22, 1985, Ser. No. 725,953
Int. Cl.[4] A63H *3/33*
U.S. Cl. 381—110 **19 Claims**



1. A voice-actuated pseudo-articulate sound generator, comprising:

sound responsive detector means for producing an electrical signal having an amplitude envelope indicative of an actuating voice;

delay means coupled to the detector means for delaying said electrical signal having said amplitude envelope for a predetermined period of time;

frequency generator means for providing a modulation signal having a randomly varying frequency;

means coupled to receive the delayed electrical signal having said amplitude envelope and the modulation signal to produce an audio output signal having an amplitude corresponding to that of the delayed electrical signal and a pitch corresponding to the modulation signal; and

means for transforming the audio output signal to sound having an amplitude envelope corresponding to said amplitude envelope of the activating voice.

4,589,139

APPARATUS FOR DETECTING DEFECTS IN PATTERN

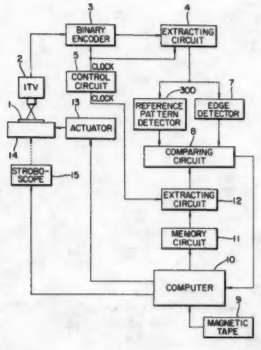
Kazunari Hada, Kawasaki; Norio Fujii, Urawa; Toru Azuma, Tokyo; Kaoru Kikuchi, Yokohama, and Junji Hazama, Kawasaki, all of Japan, assignors to Nippon Kogaku K. K., Tokyo, Japan

Filed Jan. 31, 1983, Ser. No. 462,515

Claims priority, application Japan, Feb. 4, 1982, 57-15463; May 18, 1982, 57-82355

Int. Cl.⁴ G06K *9/46*

U.S. Cl. 382—8 **10 Claims**



1. An apparatus for inspecting a pattern consisting of bright parts and dark parts formed on a planar test speciment based upon design data, said apparatus comprising:

an imaging means for scanning the pattern to generate binary signals according to the pattern;

a first extracting means for serially extracting from the binary signal binary information corresponding to a determined area on the test specimen;

a detecting means for generating a detection output upon detecting a specific shape in the determined area on the basis of the binary information, the specific shape having a boundary line between the bright parts and the dark parts of the pattern, the boundary line including a first line shorter than the width of the determined area and two parallel lines respectively extending from the ends of the first line, respectively, in opposite directions;

a second extracting means for extracting information about the specific shape which the pattern is expected to have, from the design data with relation to the location of the determined area;

an inspecting means for checking the detection output with the information extracted by the second extracting means.

4,589,140

METHOD OF AND APPARATUS FOR REAL-TIME HIGH-SPEED INSPECTION OF OBJECTS FOR IDENTIFYING OR RECOGNIZING KNOWN AND UNKNOWN PORTIONS THEREOF, INCLUDING DEFECTS AND THE LIKE

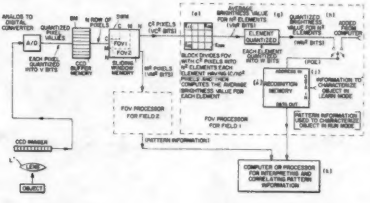
Robert Bishop, Brookline, and Derek Schwenke, Lexington, both of Mass., assignors to Beltronics, Inc., Brookline, Mass.

Filed Mar. 21, 1983, Ser. No. 477,264

Int. Cl.⁴ G06K *9/62*

U.S. Cl. 382—8 **32 Claims**

1. A method of real-time inspection of objects at a predetermined region, that comprises, optically scanning successive lines of an area of interest of the object at said region; digitizing the scanned signals in real time to produce successive trains of digital signals corresponding to the optical scanned lines; delaying the successive trains of digital signals to produce a vertical raster of successive trains of digital signals corresponding to previously optically scanned lines; reducing the vertical raster to a sub-raster containing a predetermined number of substantially horizontal (H) and vertical (V) pixels; extracting from the sub-raster group of pixels h by v in spatial distribution such that $v_i \leqq V$ and $h_i \leqq H$, where the subscript i represents the specific elements ranging from an element one pixel in size to an element V by H in size; selecting an element threshold value for each element size by predetermining a minimum and maximum number of pixels such that if the number of pixels contained in an element lies within said minimum and maximum thresholds the element value is set to the value 0 or 1, with such thresholds varying with the size of the element; delaying each element by N, 2N, 3N, etc. horizontal pixels and by N, 2N, 3N, etc. vertical pixels to generate a mask representing a visual pattern wherein each element of the mask is displaced a full element from the previous or contiguous horizontal and vertical element; in a teaching mode, optically scanning a known object to generate a mask as above, serving as an address, and storing a code number at each address to teach the recognition of the desired object; when operating with an object to be inspected in run mode, reading the code number to determine if the mask generated during the optical scanning of the object to be inspected corresponds thereto indicating the recognition of the desired object, or does not correspond thereto; and indicating if the object has not been previously seen.



4,589,141

APPARATUS FOR AUTOMATICALLY INSPECTING PRINTED LABELS

Donald J. Christian, Richardson, and Patrick A. Humm, McKinney, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 12, 1984, Ser. No. 588,484

Int. Cl.⁴ G06K *9/62*

U.S. Cl. 382—14 **5 Claims**

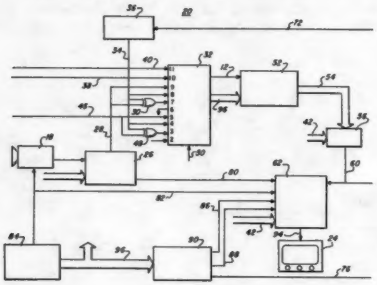
1. An automatic printed label inspecting apparatus comprising a computerized vision system for selectively inspecting labels and labeled articles and rejecting articles having labels not meeting preselected visual requirements, said apparatus including:

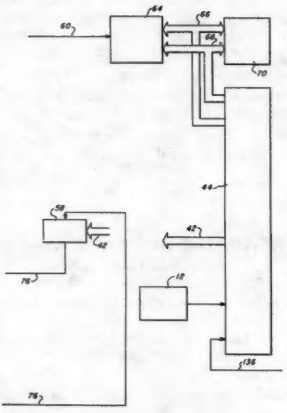
(a) an inspection station means for positioning labeled articles;

(b) a camera means positioned at the inspection station for breaking down the image of the label into small picture elements (pixels) and converting each pixel into electrical analog signals representative of the light intensity thereof (video signals); and

(c) a pattern recognition circuit means operatively connected to the camera means for receiving and processing the electrical signals representative of the pixels for selectively rejecting the labeled article; said pattern recognition circuit means having a digitizing circuit means operatively connected to the camera means, a selector means operatively connected to the digitizing circuit means, a memory means operatively connected to the selector means, a spatial low pass filter means operatively connected to the selector means and memory means, and a data processing means operatively connected to the selector means and memory means, said digitizing circuit

means operatively connected to the camera means for receiving and digitizing the analog video signals of the camera means into digital signals representative of a picture for a reference label and for subsequent labels to be inspected, the selector means operatively connected to the digitizing circuit means, memory means, spatial low pass filter means and data processing means for selectively inputting the digitized reference label picture and subsequent digitized inspection label pictures sequentially into





the memory means for comparison and generation of a digitized difference picture for each character of the label by the data processing means for storage in the memory means, and for inputting the difference picture in arrays of preselected size into the spatial low pass filter for selective comparison, the low pass filter connected to the data processing means for inputting selectively good and bad signals to the data processing means for use by the data processing means in making a good/bad decision.

4,589,142

METHOD AND APPARATUS FOR CHARACTER RECOGNITION BASED UPON THE FREQUENCY OF OCCURRENCE OF SAID CHARACTERS

Gregory M. Bednar, Matthews, N.C., assignor to International Business Machines Corp. (IBM), Armonk, N.Y.

Filed Dec. 28, 1983, Ser. No. 566,636

Int. Cl.⁴ G06K *9/70*

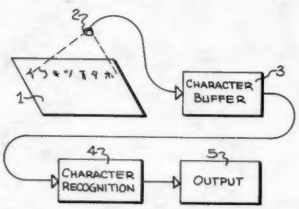
U.S. Cl. 382—37 **9 Claims**

1. A method of processing electric image data for recognizing unknown characters of a known character set based upon the frequency of occurrence of said characters, said method comprising the steps of:

converting the information representing the unknown characters into electric image data;

storing the image data of unknown characters;

segregating into at least two independent and discrete sets discriminatory logic tests for recognizing the stored image data, the first set of logic tests for recognizing the data representing a first subset of the known character set, the first subset being characters having the highest frequency of occurrence and containing less than all of the characters of the complete character set, and the second set of logic tests for recognizing a second subset of the known



character set, the second subset being characters having a lower frequency of occurrence than said first subset and containing at least some characters not in the first subset of characters;

applying the first set of discriminatory logic tests to the stored image data for recognizing only the image data that belongs to the first subset of characters; and

sequentially applying the second set of discriminatory logic tests to the image data not recognized by the application of the first set of discriminatory logic tests, the second set of iogic tests being applied independently of the first set of logic tests for recognizing only the image data that belongs to the second subset of characters.

4,589,143

INFORMATION PROCESSING MECHANISM WITH COMBINED PRINTING AND READING DEVICE

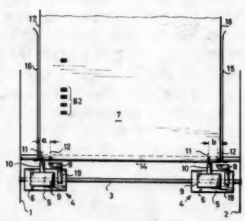
Rupert Baur; Klaus Dietel, both of Villingen-Schwenningen; Kurt Stöckler, Trossingen, and Klaus Tauchert, Villingen-Schwenningen, all of Fed. Rep. of Germany, assignors to Kienzle Apparate GmbH, Villingen-Schwenningen, Fed. Rep. of Germany

Filed Apr. 22, 1983, Ser. No. 487,616

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1982, 3215225

Int. Cl.⁴ G06K *9/20*

U.S. Cl. 382—61 **9 Claims**



1. An information processing mechanism having a combined printing and reading device for processing characters on documents comprising a record carrier for holding said documents, a needle printing head and a reading head arranged adjacent

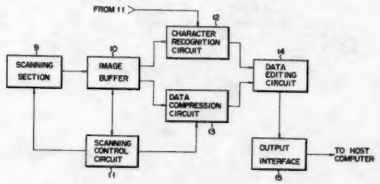
one another, a common carrier having said printing head and reading head mounted thereon, said common carrier being mounted for reciprocating movement in front of said record carrier between two defined end positions with said needle printing head including a magnet carrier and a needle guide member extending from said magnet carrier toward said record carrier, said needle guide member having a smaller dimension than said magnet carrier taken in the direction of said reciprocating movement of said common carrier, and with said reading head comprising optical and photoelectric scanning elements, means defining a reading window through which light may pass to said optical and photoelectric scanning elements and light beam deflection means inside said reading head arranged between said reading window and said photoelectric scanning elements, said reading head having said reading window arranged in side-by-side relationship with said needle guide member to cooperate along the same line on said record carrier, with said light deflection means inside said reading head being arranged between said reading window and said photoelectric scanning elements in an arrangement whereby said reading head with its optical and photoelectric elements is located to occupy the space between said magnet carrier and said record carrier alongside said needle guide member, with said photoelectric elements being located on a side of said reading window away from said needle guide member to enable said needle guide member and said reading window to be in as close a proximity as possible.

4,589,144

CHARACTER AND IMAGE PROCESSING APPARATUS

Hiromi Namba, Tokorozawa, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 9, 1982, Ser. No. 448,324
Claims priority, application Japan, Dec. 15, 1981, 56-201840
Int. Cl.[4] G06K *9/20*
U.S. Cl. 382—61 **12 Claims**



1. An apparatus for processing a printed sheet, said apparatus comprising:

scanning means for scanning the sheet and for photoelectrically converting the information printed on said sheet to data;

storage means for storing the photoelectrically converted data;

a plurality of bars, imprinted on said sheet in a longitudinal direction and a lateral direction with respect to a predetermined dimension of said sheet, for specifying both the range of data to be processed in two coordinate dimensions and one of a character read-out mode and an image data read-out mode, the number of said plurality of bars printed on said sheet encoding one of a plurality of predetermined commands, said plurality of commands including a character processing command, a skip command, an image processing command and an end of processing command;

control means for reading the data stored by said storage means to detect indicia of said bars and for selecting one of the character mode and the image data read-out mode according to said indicia of said bars;

character recognizing means for recognizing characters from data stored by said storage means when said control means selects said character read-out mode; and

image data processing means for processing data stored by said storage means as image data when said control means selects the image data read-out mode,

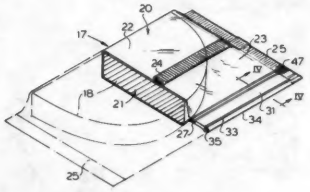
wherein said control means also disables both said character recognizing means and said image data processing means from processing data corresponding to indicia read from areas of said sheet within the range delimited by said bars encoding said skip command, and causes said apparatus to terminate processing of said data read from said sheet in response to said end of processing command.

4,589,145

PACKAGING MATERIAL AND PACKAGE

Donald L. Van Erden, Wildwood, Ill., and Steven Ausnit, New York City, N.Y., assignors to Signode Corporation, Glenview, Ill.

Filed Oct. 31, 1983, Ser. No. 547,392
Int. Cl.[4] B65D *30/00*
U.S. Cl. 383—5 **10 Claims**



1. In a wrapped bulky product-enclosing package formed from a single sheet or wrapper and having a face panel extending between opposite sides and end edges of the package, said sheet material being folded from opposite sides of the face panel into tubular envelope shape and with longitudinal margins of the sheet material sealed into a seam opposite said face panel and extending between said end edges of the envelope, and cross seals at said opposite end edges of the envelope, the improvement comprising:

zipper means comprising reclosable separable fastener profiles within one side fold of the package extending between said cross seals and in parallel relation to said seans;

said zipper means being enclosed within the package and maintaining said envelope snugged against the wrapped bulky product;

a pilfer-proof web extending between said cross seals and projecting outwardly from and along said fastener profiles, so that the envelope remains fully sealed until said web is ruptured to provide a mouth opening into the package and which is adapted to be reclosed by closing said zipper means;

said zipper means comprising profiled resiliently flexible separable zipper strips having the profiles in closed zipper relation alongside said pilfer-proof web fold;

and means for resisting separation of said zipper profiles during a product wrapping operation and in the package.

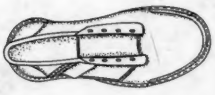
DESIGNS

MAY 13, 1986

283,748
ICE CREAM SANDWICH
James A. Duty, Springfield, Mo., assignor to Campus Creations of Missouri, Inc., Springfield, Mo.
Filed Oct. 6, 1983, Ser. No. 544,268
Term of patent 14 years
U.S. Cl. D1—106

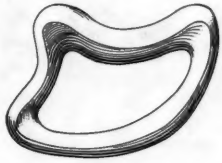
283,749
COMBINED HELMET AND BEVERAGE CONTAINER HOLDERS
Patrick S. Bound, 658 Longfellow Ct., Warminster, Pa. 18974
Filed Jul. 11, 1985, Ser. No. 753,921
Term of patent 14 years
U.S. Cl. D2—246

283,750
CASUAL SHOE WITH POCKET
Robert J. Gamm, St. Louis County, Mo., assignor to Kangaroos U.S.A., Inc., St. Louis, Mo.
Division of Ser. No. 408,650, Aug. 16, 1985, Pat. No. Des. 279,519. This application Mar. 28, 1985, Ser. No. 719,717
Term of patent 14 years
U.S. Cl. D2—313



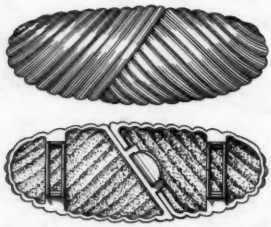
283,751
PROTECTIVE SHOE COVER
Lenore Haber, 18 Wallace Dr., Spring Valley, N.Y. 10097
Filed Aug. 29, 1983, Ser. No. 527,319
Term of patent 14 years
U.S. Cl. D2—314

283,752
BELT BUCKLE
Alexis V. Kirk, New York, N.Y., assignor to Somersett Moon Ltd., New York, N.Y.
Filed Dec. 21, 1984, Ser. No. 684,697
Term of patent 14 years
U.S. Cl. D2—405

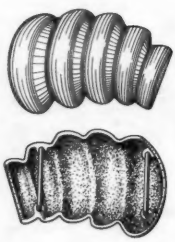


283,753
BELT BUCKLE
Alexis V. Kirk, New York, N.Y., assignor to Somersett Moon Ltd., New York, N.Y.
Filed Jan. 4, 1985, Ser. No. 688,645
Term of patent 14 years
U.S. Cl. D2—405

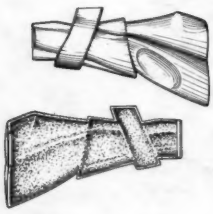
283,754
BELT BUCKLE
Alexis V. Kirk, New York, N.Y., assignor to Somersett Moon Ltd., New York, N.Y.
Filed Jan. 4, 1985, Ser. No. 688,894
Term of patent 14 years
U.S. Cl. D2—405



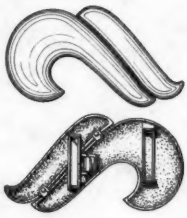
283,755
BELT BUCKLE
Alexis V. Kirk, New York, N.Y., assignor to Somersett Moon, Ltd., New York, N.Y.
Filed Dec. 21, 1984, Ser. No. 684,704
Term of patent 14 years
U.S. Cl. D2—405



283,756
BELT BUCKLE
Alexis V. Kirk, New York, N.Y., assignor to Somersett Moon Ltd., New York, N.Y.
Filed Jan. 4, 1985, Ser. No. 688,895
Term of patent 14 years
U.S. Cl. D2—405

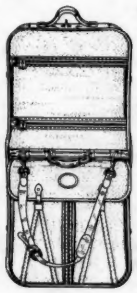


283,757
BELT BUCKLE
Alexis V. Kirk, New York, N.Y., assignor to Somersett Moon Ltd., New York, N.Y.
Filed Dec. 21, 1984, Ser. No. 684,705
Term of patent 14 years
U.S. Cl. D2—422



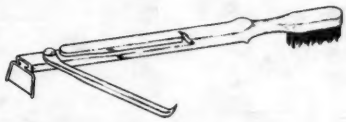
283,758
BEVERAGE CAN HOLDER
Michael W. Stewart, Niles, Mich., and Norman P. Johnson, Nappanee, Ind., assignors to Stewart-Johnson, Inc., Nappanee, Ind.
Filed May 2, 1983, Ser. No. 490,394
Term of patent 14 years
U.S. Cl. D3—30.1

283,759
GARMENT BAG
Richard B. Gibbs, 11548 Thurston Cir., Los Angeles, Calif. 90049
Filed Dec. 28, 1983, Ser. No. 566,268
Term of patent 14 years
U.S. Cl. D3—71



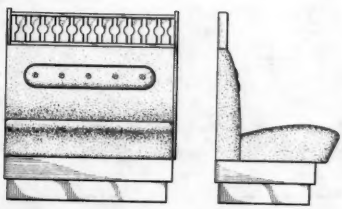
283,760
SUITCASE
Richard B. Gibbs, 11548 Thurston Cir., Los Angeles, Calif. 90049
Filed Jan. 11, 1984, Ser. No. 570,010
Term of patent 14 years
U.S. Cl. D3—71

283,761
COMBINED TOOTHBRUSH, FLOSSER AND TOOTHPICK
Ching-Chou Chen, No. 1, La. 76, Hu-Lin St., Taipei, Taiwan
Filed Mar. 28, 1984, Ser. No. 596,082
Term of patent 14 years
U.S. Cl. D4—108

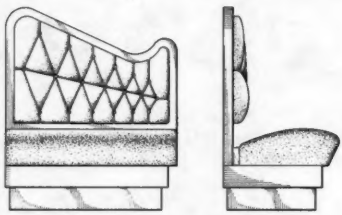


283,762
CHAIR FOR USE PRIMARILY BY A DRAFTSMAN
Jerome Caruso, 1165 W. Ash Lawn Dr., Lake Forest, Ill. 60045
Division of Ser. No. 470,023, Feb. 25, 1983, which is a continuation of Ser. No. 142,259, Apr. 21, 1980. This application Apr. 30, 1984, Ser. No. 576,642
Term of patent 14 years
U.S. Cl. D6—360

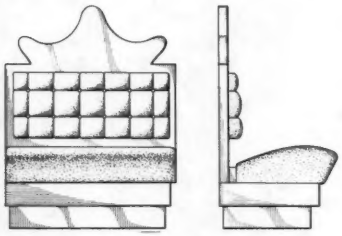
283,763
RESTAURANT BOOTH SEAT
Christos Livieratos, Chicago, Ill., assignor to Chicago Booth Mfg. Co., Inc., Chicago, Ill.
Filed Dec. 12, 1983, Ser. No. 560,860
Term of patent 14 years
U.S. Cl. D6—364



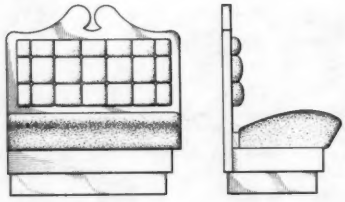
283,764
RESTAURANT BOOTH SEAT
Christos Livieratos, Chicago, Ill., assignor to Chicago Booth Mfg. Co., Inc., Chicago, Ill.
Filed Dec. 12, 1983, Ser. No. 560,861
Term of patent 14 years
U.S. Cl. D6—364



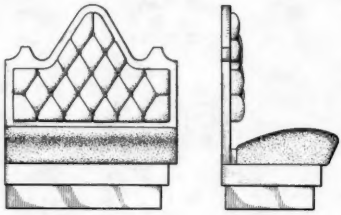
283,765
RESTAURANT BOOTH SEAT
Christos Livieratos, Chicago, Ill., assignor to Chicago Booth Mfg. Co., Inc., Chicago, Ill.
Filed Dec. 12, 1983, Ser. No. 560,328
Term of patent 14 years
U.S. Cl. D6—364



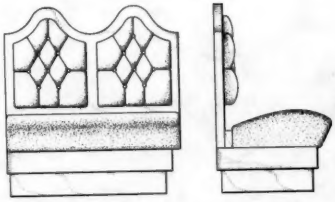
283,766
RESTAURANT BOOTH SEAT
Christos Livieratos, Chicago, Ill., assignor to Chicago Booth Mfg. Co., Inc., Chicago, Ill.
Filed Dec. 12, 1983, Ser. No. 560,329
Term of patent 14 years
U.S. Cl. D6—364



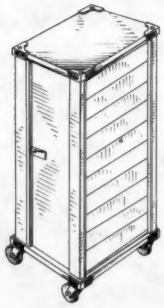
283,767
RESTAURANT BOOTH SEAT
Christos Livieratos, Chicago, Ill., assignor to Chicago Booth Mfg. Co., Inc., Chicago, Ill.
Filed Dec. 12, 1983, Ser. No. 560,331
Term of patent 14 years
U.S. Cl. D6—364



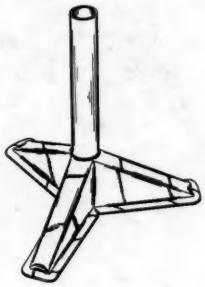
283,768
RESTAURANT BOOTH SEAT
Christos Livieratos, Chicago, Ill., assignor to Chicago Booth Mfg. Co., Inc., Chicago, Ill.
Filed Dec. 12, 1983, Ser. No. 560,863
Term of patent 14 years
U.S. Cl. D6—364



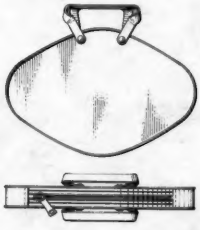
283,769
DELIVERY/STORAGE CABINET
Robert J. Cohn, Dallas, Pa., assignor to InterMetro Industries Corp., Wilkes-Barre, Pa.
Filed Jun. 27, 1983, Ser. No. 508,332
Term of patent 14 years
U.S. Cl. D6—446



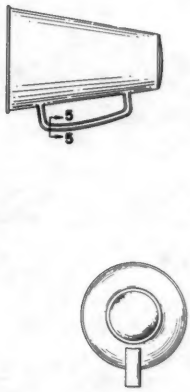
283,770
STAND
Väinö Hänninen, Rydbergstorpsvägen Falkenberg, Sweden
Filed Jun. 13, 1983, Ser. No. 503,674
Claims priority, application Sweden, Dec. 13, 1982, 82-2980
Term of patent 14 years
U.S. Cl. D6—498



283,771
STADIUM CUSHION
John Howard, 6302 Broadway, San Diego, Calif. 92114
Filed May 7, 1984, Ser. No. 607,675
Term of patent 14 years
U.S. Cl. D6—596

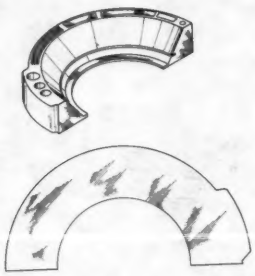


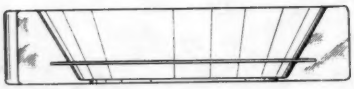
283,772
COMBINED MUG AND MEGAPHONE
John G. Vail, Oakland, Calif., assignor to Mug-A-Phone, Inc., Daytona, Fla.
Filed Dec. 21, 1983, Ser. No. 563,959
Term of patent 14 years
U.S. Cl. D7—9



283,773
CHAMPAGNE GLASS
Alfred Blake, Hillsdale, N.J., and Michael Lax, New York, N.Y., assignors to American Commercial, Incorporated, Secaucus, N.J.
Filed Jun. 6, 1983, Ser. No. 501,170
The portion of the term of this patent subsequent to May 6, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—13

283,774
TRAY ATTACHMENT
Freda L. Bratcher, 734 Pine St., Westville Grove, N.J. 08093
Filed Sep. 2, 1983, Ser. No. 528,978
Term of patent 14 years
U.S. Cl. D7—39

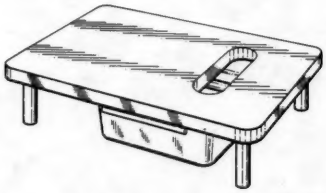


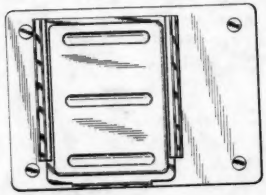


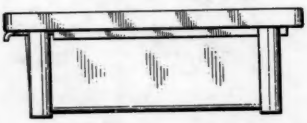
283,775
DRINKING VESSEL BASE
William P. Campbell, 2103 Bayside Dr., Corona del Mar, Calif. 92625
Filed Mar. 21, 1983, Ser. No. 477,315
Term of patent 14 years
U.S. Cl. D7—39

283,776
DECAL FOR USE ON CHINA DINNERWARE OR SIMILAR ARTICLES
Simone Colquitt, New York, N.Y., assignor to Syracuse China Corporation, Syracuse, N.Y.
Division of Ser. No. 486,038, Apr. 18, 1983, Pat. No. 281,126.
This application Jul. 31, 1985, Ser. No. 760,914
Term of patent 14 years
U.S. Cl. D7—39

283,777
RAISED CUTTING BOARD
Andre R. Morin, Dollard des Ormeaux, Canada, assignor to Namaar Enterprises Inc., Bolton, Canada
Filed May 25, 1983, Ser. No. 498,123
Term of patent 14 years
U.S. Cl. D7—46

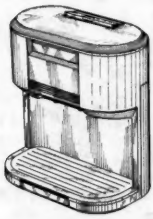




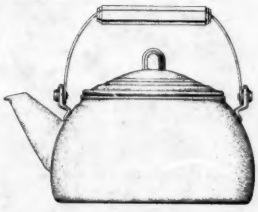


283,778
COFFEE MAKER
Alister Jack, Grijpskerk, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Dec. 5, 1983, Ser. No. 558,063
Claims priority, application Benelux, Jun. 20, 1983, 57982-00
Term of patent 14 years
U.S. Cl. D7—309

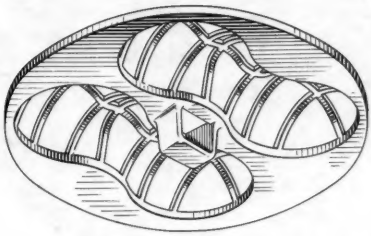
283,779
COFFEE MAKER
Aloysius J. M. Beeren, Haren, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Dec. 30, 1983, Ser. No. 566,943
Claims priority, application Benelux, Jul. 28, 1983, 58101-00
Term of patent 14 years
U.S. Cl. D7—309



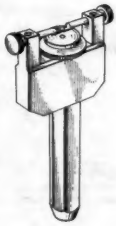
283,780
KETTLE
Larry R. Laslo, New York, N.Y., assignor to American Commercial, Incorporated, Secaucus, N.J.
Filed Dec. 9, 1983, Ser. No. 559,930
Term of patent 14 years
U.S. Cl. D7—320



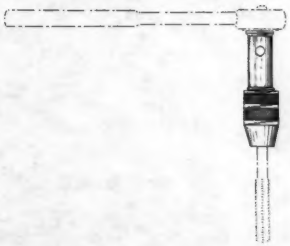
283,781
EGG COOKER
Steven R. Hutchison, 22 Hayward Ave., Torrensville, Australia 5000
Filed Apr. 21, 1983, Ser. No. 487,128
Term of patent 14 years
U.S. Cl. D7—357



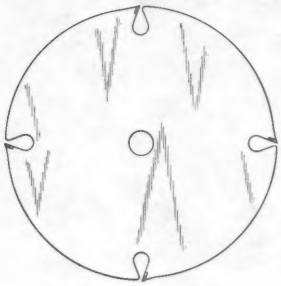
283,782
CLAMP FOR JEWELRY FINDING
Gary D. Cowdery, Lincoln City, and Thomas J. Owczarzak, Gleneden Beach, both of Oreg., assignors to A-Dec Diversified, Inc., Newberg, Oreg.
Filed Sep. 15, 1983, Ser. No. 533,137
Term of patent 14 years
U.S. Cl. D8—74



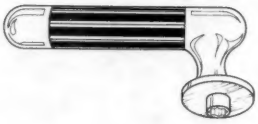
283,783
THREADING TAP HOLDING CHUCK
Hong K. Park, 300 Harolds Dr., Huntsville, Ala. 35806
Filed Aug. 26, 1983, Ser. No. 526,706
Term of patent 14 years
U.S. Cl. D8—59



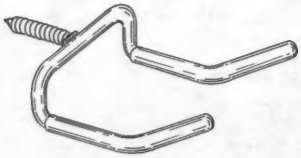
283,784
CIRCULAR SAW BLADE
Frederic G. Croydon, Portland, Oreg., assignor to Omark Industries, Inc., Portland, Oreg.
Filed Jul. 26, 1982, Ser. No. 402,136
Term of patent 14 years
U.S. Cl. D8—70



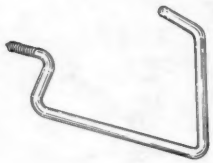
283,785
DOOR HANDLE
Serge Belaiche, Paris, France, assignor to Serdaneli, France
Filed Sep. 14, 1984, Ser. No. 651,065
Claims priority, application France, Mar. 16, 1984, 841 172
Term of patent 14 years
U.S. Cl. D8—308



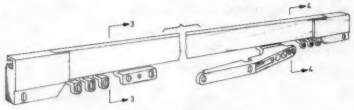
283,786
HOOK
John P. Chap, Lemont, Ill., assignor to Selfix, Inc., Chicago, Ill.
Filed Nov. 14, 1983, Ser. No. 551,208
Term of patent 14 years
U.S. Cl. D8—370



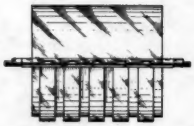
283,787
UTILITY HOOK
John P. Chap, Lemont, Ill., assignor to Selfix, Inc., Chicago, Ill.
Filed Nov. 14, 1983, Ser. No. 551,207
Term of patent 14 years
U.S. Cl. D8—370



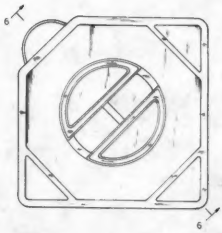
283,788
TRAVERSE CURTAIN ROD
Terence A. Cox; Paul M. Johnson, and Philip C. Horton, all of Tamworth, England, assignors to Swish Products Limited, Staffordshire, England
Filed Sep. 7, 1983, Ser. No. 530,004
Claims priority, application United Kingdom, Jun. 20, 1983, 1013660
Term of patent 14 years
U.S. Cl. D8—377



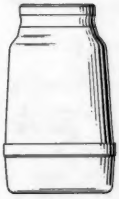
283,789
MULTIPLE REEL TAPE DISPENSER
George E. Kodousek, Milwaukee, and Lawrence S. Greco, Mequon, both of Wis., assignors to North American Philips Corporation, New York, N.Y.
Filed Nov. 3, 1983, Ser. No. 548,394
Term of patent 14 years
U.S. Cl. D9—341



283,790
TRAY FOR A GARDEN WATERING SET
Jack L. Lemkin, Cincinnati; Eugene A. Zilber, and Carl A. Peterson, both of Columbus, all of Ohio, assignors to The O. M. Scott & Sons Company, Marysville, Ohio
Filed Apr. 8, 1983, Ser. No. 483,120
Term of patent 14 years
U.S. Cl. D9—347



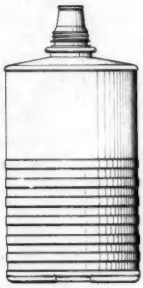
283,791
PACKAGING CONTAINER
Vincent E. Fortuna, Huntington Beach, Calif., and Donald N. MacLaughlin, Midland, Mich., assignors to Vercon, Inc., Dallas, Tex.
Filed Apr. 9, 1984, Ser. No. 597,955
Term of patent 14 years
U.S. Cl. D9—349



283,792
PACKAGING CONTAINER
Vincent E. Fortuna, Huntington Beach, Calif., and Donald N. MacLaughlin, Midland, Mich., assignors to Cosden Technology, Inc., Dallas, Tex.
Filed Apr. 9, 1984, Ser. No. 598,124
Term of patent 14 years
U.S. Cl. D9—349

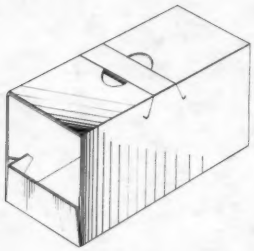
283,793
PACKAGING CONTAINER
Vincent E. Fortuna, Huntington Beach, Calif., and Donald N. MacLaughlin, Midland, Mich., assignors to Vercon, Inc., Dallas, Tex.
Filed Apr. 30, 1984, Ser. No. 605,519
Term of patent 14 years
U.S. Cl. D9—349

283,794
BOTTLE
Simon J. Richter, Marietta, Ga., assignor to The Coca-Cola Company, Atlanta, Ga.
Filed Jun. 16, 1983, Ser. No. 504,866
Term of patent 14 years
U.S. Cl. D9—396

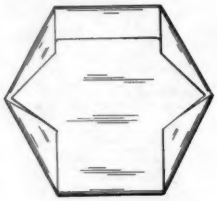


283,795
BOTTLE
Alain Demourgues, Paris, France, assignor to Saint-Gobain-Desjonqueres, Courbevoie, France
Filed Dec. 8, 1983, Ser. No. 559,319
Claims priority, application France, Jun. 8, 1983, 832 144
Term of patent 14 years
U.S. Cl. D9—413

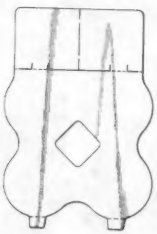
283,796
CARTON
Richard L. Schuster, Monroe, La., assignor to Manville Service Corporation, Denver, Colo.
Filed Dec. 2, 1983, Ser. No. 557,681
Term of patent 14 years
U.S. Cl. D9—418



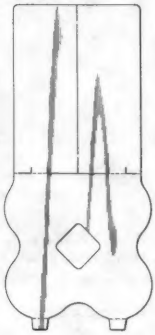
283,797
EXPANDABLE FOOD CONTAINER
James W. Montealegre, Roseville, Minn., assignor to Container Corporation of America, Chicago, Ill.
Filed Dec. 9, 1983, Ser. No. 559,713
Term of patent 14 years
U.S. Cl. D9—431



283,798
COVER FOR MULTIPACK OF BEVERAGE CANS
Christopher J. Griffin, London, England, assignor to Metal Box p.l.c., Wantage, England
Filed Nov. 1, 1983, Ser. No. 547,725
Claims priority, application United Kingdom, May 6, 1983, 1012903
Term of patent 14 years
U.S. Cl. D9—435



283,799
COVER FOR MULTIPACK OF BEVERAGE CANS
Christopher J. Griffin, London, England, assignor to Metal Box, plc, Wantage, England
Filed Nov. 1, 1983, Ser. No. 547,724
Claims priority, application United Kingdom, May 6, 1983, 1012902
Term of patent 14 years
U.S. Cl. D9—435

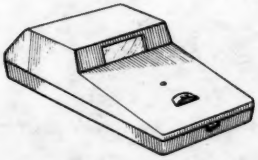


283,800
LIQUID DISPENSING SPOUT
Cornelis J. Beerens, 40-42 Berkshire Rd., North Sunshine, Melbourne Victoria, Australia
Filed Jun. 20, 1983, Ser. No. 506,040
Claims priority, application Australia, Mar. 17, 1983, 3228/83
Term of patent 14 years
U.S. Cl. D9—447

283,801
SPRAY GUN FOR AEROSOL CAN
Philip M. Brown, 1222 Colt, and Richard S. Podgorski, Rte. 5, Box 117, both of Denton, Tex. 76201
Filed Aug. 3, 1983, Ser. No. 519,964
Term of patent 14 years
U.S. Cl. D9—448

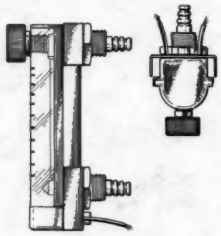
283,802
CLOCK
Wasyl W. Semenec, 4153 Shirlee La. South, Shoreview, Minn. 55112
Filed Jan. 9, 1984, Ser. No. 569,337
Term of patent 14 years
U.S. Cl. D10—21

283,803
COUNTERFEIT CURRENCY EXAMINING DEVICE
Lincoln M. Zonn, 1171 NE. 90th St., Miami, Fla. 33138
Filed Jan. 16, 1984, Ser. No. 570,936
Term of patent 14 years
U.S. Cl. D10—46

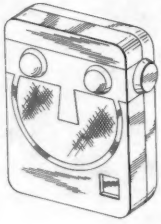


283,804
FLOWMETER
Craig Waters, Lansdale, Pa., assignor to Matheson Gas Products, Inc., Secaucus, N.J.
Filed Dec. 2, 1983, Ser. No. 557,642
Term of patent 14 years
U.S. Cl. D10—96

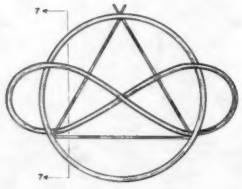
283,805
FLOWMETER
Craig Waters, Lansdale, Pa., assignor to Matheson Gas Products, Inc., Secaucus, N.J.
Filed Dec. 2, 1983, Ser. No. 557,742
Term of patent 14 years
U.S. Cl. D10—96



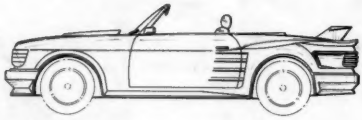
283,806
PERSONAL SECURITY ALARM
George H. Harris, 2237 Elm St., Youngstown, Ohio 44505
Filed Oct. 12, 1984, Ser. No. 660,232
Term of patent 14 years
U.S. Cl. D10—106

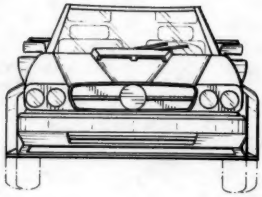


283,807
PENDANT
John J. Dobbins, 721 Woodbine Rd., Huntsville, Ala. 35802
Filed Jan. 16, 1984, Ser. No. 570,999
Term of patent 14 years
U.S. Cl. D11—79

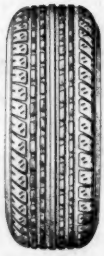


283,808
AUTOMOBILE BODY
Vittorio Strosek, Utting, Fed. Rep. of Germany, assignor to Silver Star Motors, Inc., Pompano Beach, Fla.
Filed Feb. 20, 1985, Ser. No. 703,597
Term of patent 14 years
U.S. Cl. D12—92



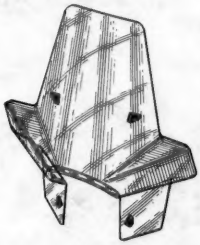


283,809
AUTOMOBILE TIRE
Izumi Kuramochi; Hiroshi Tokizaki; both of Tokyo; Isamu Irie, Hiratsuka; Tadashi Harashima, Kanagawa, and Atsunori Agari, Hadano, all of Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan
Filed Dec. 8, 1983, Ser. No. 559,286
Claims priority, application Japan, Jun. 9, 1983, 58-24529
Term of patent 14 years
U.S. Cl. D12—145

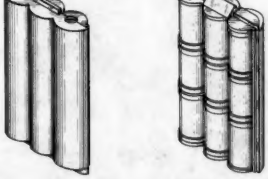


283,810
MOTORCYCLE TIRE
Hideyuki Teramoto, Kobe, Japan, assignor to Sumitomo Rubber Industries, Ltd., Kobe, Japan
Filed Apr. 25, 1984, Ser. No. 603,735
Claims priority, application Japan, Oct. 29, 1983, 58-47059
Term of patent 14 years
U.S. Cl. D12—147

283,811
CLEAR HANDLEBAR FAIRING
Timothy M. Sullivan, Rantoul, and Martin L. Meitl, Champaign, both of Ill., assignors to Vetter Products, Inc., Rantoul, Ill.
Filed May 25, 1983, Ser. No. 509,851
Term of patent 14 years
U.S. Cl. D12—182

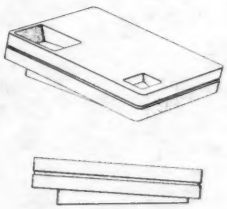


283,812
REMOVABLE BATTERY PACK
James P. Liautaud, Trout Valley, Cary, Ill. 60013; Peter F. Stultz, Elgin, Ill., and David L. Maloney, Barrington, Ill., assignors to James P. Liautaud, Cary, Ill.
Filed Sep. 6, 1983, Ser. No. 529,956
Term of patent 14 years
U.S. Cl. D13—4

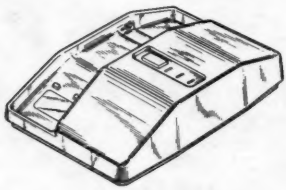


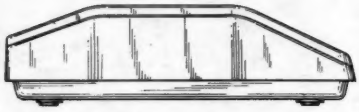
283,813
WINGED HEAT SINK WITH SOLDERABLE TABS, FOR ENCASED ELECTRICAL PACKAGES
Alfred F. McCarthy, Belmount, N.H., assignor to Aavid Engineering, Inc., Laconia, N.H.
Filed Mar. 25, 1983, Ser. No. 478,918
Term of patent 14 years
U.S. Cl. D13—23

283,814
TELEPHONE STAND
Donald M. Genaro, Haworth, N.J., and John N. McGarvey, Drexel Hill, Pa., assignors to AT&T Bell Laboratories, Murray Hill, N.J.
Continuation-in-part of Ser. No. 455,916, Jan. 5, 1983, abandoned. This application Mar. 5, 1984, Ser. No. 586,202
Term of patent 14 years
U.S. Cl. D14—60

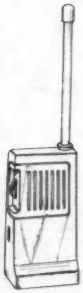


283,815
CORDLESS TELEPHONE BASE
David O. Edwards, Chigwell Row, and Brian Allars, Hockley, both of England, assignors to British Telecommunications, London, England
Filed Sep. 26, 1983, Ser. No. 535,896
Claims priority, application United Kingdom, Mar. 24, 1983, 1012154
Term of patent 14 years
U.S. Cl. D14—60

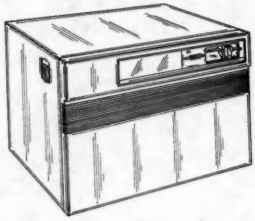




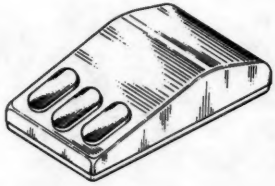
283,816
MONITOR RECEIVER
Gordon L. Cutler, Miamisburg, Ohio, assignor to The Quaker Oats Company, Chicago, Ill.
Filed Feb. 7, 1984, Ser. No. 577,870
Term of patent 14 years
U.S. Cl. D14—68



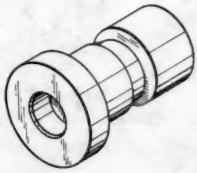
283,817
CENTRAL PROCESSING UNIT FOR COMPUTER
Junichi Sakamoto, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Oct. 21, 1983, Ser. No. 544,355
Claims priority, application Japan, Apr. 21, 1983, 58-17130
Term of patent 14 years
U.S. Cl. D14—102



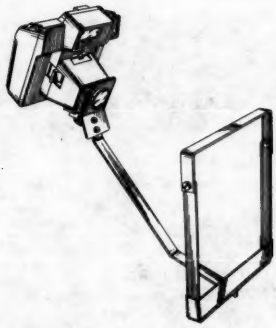
283,818
CURSOR FOR COMPUTER DISPLAY TERMINAL
Paul Skaggs, Spokane, Wash., assignor to Key Tronic Corporation, Spokane, Wash.
Filed Dec. 19, 1983, Ser. No. 562,986
Term of patent 14 years
U.S. Cl. D14—114



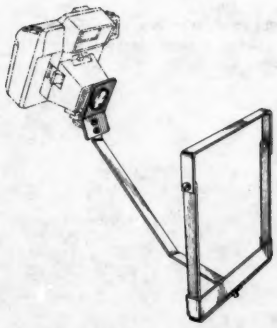
283,819
CLUTCH PLATE ALIGNMENT HUB
William E. Brown, 95 Elmwood Dr., Springboro, Ohio 45066
Filed Apr. 18, 1983, Ser. No. 486,222
Term of patent 14 years
U.S. Cl. D15—148



283,820
CAMERA WITH FRAMING AND SPACING DEVICE
Edgar S. Lemmey, Woodbury, N.Y., assignor to Lester A. Dine, Inc., Farmingdale, N.Y.
Filed Dec. 21, 1983, Ser. No. 564,075
Term of patent 14 years
U.S. Cl. D16—6

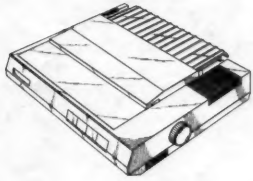


283,821
FRAMING AND SPACING DEVICE FOR CAMERA
Edgar S. Lemmey, Woodbury, N.Y., assignor to Lester A. Dine, Inc., Farmingdale, N.Y.
Filed Dec. 21, 1983, Ser. No. 564,076
Term of patent 14 years
U.S. Cl. D16—10

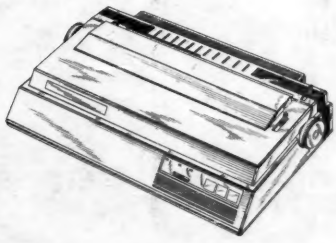


283,822
CASH REGISTER
Katsuhiro Ishida, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Aug. 9, 1984, Ser. No. 639,262
Claims priority, application Japan, Feb. 13, 1984, 59-5110
Term of patent 14 years
U.S. Cl. D18—4

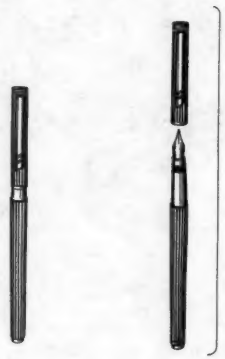
283,823
PRINTER
Toshio Mitsuhashi, Tokyo, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan
Filed Oct. 2, 1984, Ser. No. 656,988
Claims priority, application Japan, Jul. 26, 1984, 59-31028
Term of patent 14 years
U.S. Cl. D18—13



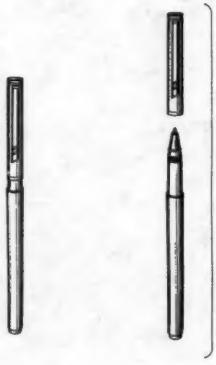
283,824
PRINTER
Sanae Takada, Chofu, Japan, assignor to Tokyo Juki Industrial Co., Ltd., Tokyo, Japan
Filed Apr. 6, 1984, Ser. No. 597,357
Term of patent 14 years
U.S. Cl. D18—13



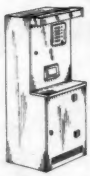
283,825
PEN
Daniel Hechter, 62 Avenue Foch, Paris 8, France
Filed Sep. 16, 1983, Ser. No. 533,034
Claims priority, application France, Mar. 17, 1983, 831014
Term of patent 14 years
U.S. Cl. D19—49



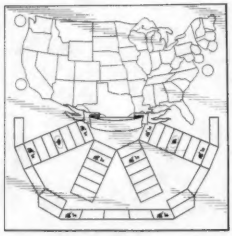
283,826
PEN
Daniel Hechter, 62 Avenue Foch, Paris 8, France
Filed Sep. 16, 1983, Ser. No. 532,955
Claims priority, application France, Mar. 17, 1983, 831014
Term of patent 14 years
U.S. Cl. D19—51



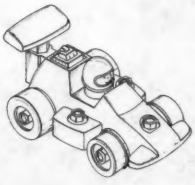
283,827
VENDING CABINET
Henry J. Albright, West Des Moines, Iowa, assignor to Fawn Engineering Corp., Des Moines, Iowa
Filed Jun. 13, 1983, Ser. No. 503,497
Term of patent 14 years
U.S. Cl. D20—4



283,828
GAME BOARD
Gary K. Haney, 147 Tulloch Dr., Ajax, Ontario, Canada (L1S 2S7)
Filed Oct. 26, 1983, Ser. No. 545,453
Claims priority, application Canada, Sep. 1, 1983, 01-09-83-16
Term of patent 14 years
U.S. Cl. D21—31

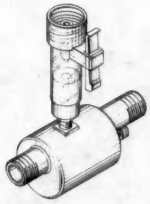


283,829
TOY RACE CAR
Hiromi Kamikawa, Tokyo, Japan, assignor to The Quaker Oats Company, Chicago, Ill.
Filed Feb. 7, 1984, Ser. No. 577,856
Term of patent 14 years
U.S. Cl. D21—137



283,830
FLEXIBLE FISH HOOK
Edward G. Powell, 1551 Talmadge Ct., Ukiah, Calif. 95482
Filed Oct. 6, 1983, Ser. No. 539,579
Term of patent 14 years
U.S. Cl. D22—30

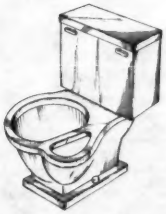
283,831
ADDITIVE LIQUID METERING DEVICE
Mitchell E. Maddock, Rte. 1, Box 24AA, Florence, Ariz. 85232
Filed Jul. 5, 1983, Ser. No. 510,957
Term of patent 14 years
U.S. Cl. D23—19



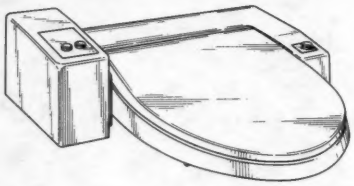
283,832
SPRAY APPARATUS HOUSING FOR LIQUIDS, POWDER AND THE LIKE
Richard Weinstein, Toledo, Ohio, and David M. Seitz, Blissfield, Mich., assignors to Champion Spark Plug Company, Toledo, Ohio
Filed May 2, 1983, Ser. No. 490,837
Term of patent 14 years
U.S. Cl. D23—18

283,833
ELBOW FOR A VARIABLE ANGLE JOINT
Hugh M. G. Macintyre, London, England, assignor to Douglas C. P. J. Camp, Cheam, England
Filed Mar. 10, 1983, Ser. No. 474,195
Claims priority, application United Kingdom, Dec. 9, 1982, 1010181
Term of patent 14 years
U.S. Cl. D23—43

283,834
COMBINED TOILET AND URINAL
Charles A. Grudzinskas, 3390 McCabe Ave., NE., Ada, Mich. 49301
Filed Jun. 17, 1983, Ser. No. 505,183
Term of patent 14 years
U.S. Cl. D23—49

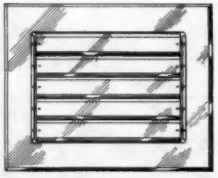


283,835
COMBINED BIDET TOILET SEAT AND COVER
Eiki Maruyama, and Tetsuo Imai, both of Nagano, Japan, assignors to Maruyama Industrial Co., Ltd., Koshoku, Japan
Filed Oct. 24, 1983, Ser. No. 545,006
Claims priority, application Japan, Apr. 23, 1982, 57-17878
Term of patent 14 years
U.S. Cl. D23—51

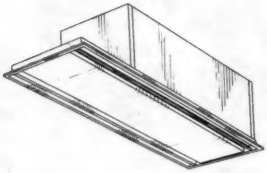


283,836
SOLAR SPACE HEATER
Oak Surber, Cincinnati, and Ronald Lee, Loveland, both of Ohio, assignors to Resource Technologies, Inc., Cincinnati, Ohio
Filed Apr. 7, 1983, Ser. No. 482,798
Term of patent 14 years
U.S. Cl. D23—72

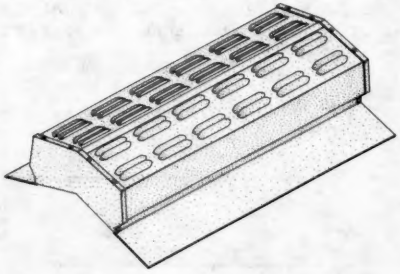
283,837
VENT LOUVER
Stanley Oster, 6951 NW. 15 Ave., Ft. Lauderdale, Fla. 33309
Filed Apr. 6, 1983, Ser. No. 482,565
Term of patent 14 years
U.S. Cl. D23—115



283,838
HOUSING FOR AN AIR CONDITIONER
Keiichi Kimura, Yao, Japan, assignor to Kimura Koki Company Limited, Osaka, Japan
Filed Aug. 29, 1983, Ser. No. 527,406
Term of patent 14 years
U.S. Cl. D23—141



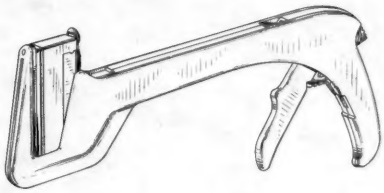
283,839
ROOFLINE VENTILATOR
Harold G. Kutsch, and Earl A. Ehrlich, both of Dubuque, Iowa, assignors to Klauer Manufacturing Company, Dubuque, Iowa
Filed Mar. 8, 1984, Ser. No. 587,504
Term of patent 14 years
U.S. Cl. D23—153



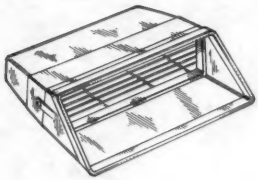
283,840
DENTAL REAMER
Kanzi Matsutani, Tochigi, Japan, assignor to Matsutani Seisakusho, Shioya, Japan
Filed Apr. 8, 1983, Ser. No. 483,460
Term of patent 14 years
U.S. Cl. D24—10

283,841
ORTHODONTIC UTILITY PLIER
Craven H. Kurz, 465 N. Roxbury Dr., #1011, Beverly Hills, Calif. 90210
Filed Sep. 29, 1982, Ser. No. 426,849
Term of patent 14 years
U.S. Cl. D24—10

283,842
LINEAR SURGICAL FASTENER APPLIER
Paul O. Rawson, Easton, and Richard Yagami, Bridgewater, both of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.
Filed Oct. 4, 1983, Ser. No. 538,932
Term of patent 14 years
U.S. Cl. D24—26



283,843
AUXILIARY VEHICLE BRAKE LIGHT
George Payne, Bedford Hills, N.Y., and Joel Rudder, Rockaway, N.J., assignors to General Automotive Specialty Co., Inc., New Brunswick, N.J.
Filed Sep. 20, 1985, Ser. No. 778,376
Term of patent 14 years
U.S. Cl. D26—28



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 13TH DAY OF MAY, 1986

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. E. Staley Manufacturing Company: *See—*
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A. Lakin & Sons, Inc.: *See—*
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A. O. Smith Corporation: *See—*
Kozak, Norman M.; and Klinke, Bernard R., 4,588,875, Cl. 219-485.000.

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Abe, Mitsuo: *See—*
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Abegglen, Heinz, to Grapha-Holding AG. Apparatus for applying adhesive to stacked sheets in bookbinding machines. 4,588,470, Cl. 156-578.000.

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Esser, Franz; Koppe, Herbert; Abele, Wolfgang; and Stockhaus, Klaus, 4,588,736, Cl. 514-392.000.

Abell, Donald E., to Alvey Inc. Padded chain live roller conveyor. 4,588,073, Cl. 198-781.000.

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Adachi, Eiichi, to Ricoh Company, Ltd. Arq equipped data communication system. 4,589,111, Cl. 371-32.000.

Adam, Jean-Marie, to Ciba-Geigy Corporation. Dyestuff quinophthalone derivatives. 4,588,811, Cl. 544-128.000.

Adami, Hans J., to U.S. Philips Corporation. Stepping motor linear actuator with internal clutch. 4,588,913, Cl. 310-78.000.

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Adams, Robert W., to DBX, Inc. Analog-to-digital converter. 4,588,979, Cl. 340-347.0AD.

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Adnovum AG: *See—*
Lauchenauer, Alfred E., 4,588,614, Cl. 427-243.000.

Adolfsson, Bengt O., to Kommanditbolaget Aldolf. Apparatus for suppling gas to a liquid in a container. 4,588,536, Cl. 261-121.00R.

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Advanced Energy Fund Limited Partnership: *See—*
Vernon, Stanley M., 4,588,451, Cl. 148-175.000.

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Nishida, Yoshinori; Imai, Tsunemichi; and Matsubara, Hiromi, 4,587,707, Cl. 29-527.700.
Sakai, Shigeki; Tateno, Hiroshi; and Kataoka, Shoei, 4,589,001, Cl. 357-5.000.

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Aisin-Warner Kabushiki Kaisha: *See—*
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Akada, Mitsuo: *See—*
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Akashi, Goro: *See—*
Kitamoto, Tatsuji; Shirahata, Ryuji; Yamada, Yasuyuki; and Akashi, Goro, 4,588,656, Cl. 428-694.000.

Akashi, Kazuo: *See—*
Nakamura, Teruo; Kiyoto, Michio; Akashi, Kazuo; and Hasegawa, Isao, 4,588,431, Cl. 71-24.000.

Akatsuka, Yuichiro, to Olympus Optical Co., Ltd. TV video data input apparatus. 4,589,020, Cl. 358-160.000.

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Mizuta, Ken; Kondo, Shiro; and Akazawa, Michitada, 4,588,877, Cl. 200-67.0DB.

Akechi Ceramics Kabushiki Kaisha: *See—*
Kondo, Masanao, 4,588,112, Cl. 222-603.000.

AKG Akustische u.Kino-Gerate GmbH: *See—*
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Akiba, Shigeyuki: *See—*
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Akio, Matsumoto: *See—*
Yoshiyuki, Iwaki; Akio, Matsumoto; and Mitsuyoshi, Yokota, 4,588,939, Cl. 322-88.000.

Aktiebolaget ASEA-ATOM: *See—*
Blomstrand, Jan; Johansson, Anders; Junkrans, Sigvard; Nylund, Olov; and van Santen, Aart, 4,588,550, Cl. 376-438.000.

Aktiebolaget SKF: *See—*
Hallerback, Stig L., 4,587,715, Cl. 29-525.000.

Aktieselskabet Aalborg Pottland-Cement-Fabrik: *See—*
Bache, Hans H., 4,588,443, Cl. 106-97.000.

Albany International Corp.: *See—*
Donovan, James G., 4,588,635, Cl. 428-288.000.

Albarda, Scato, to Dragerwerk Aktiengesellschaft. Device for evaluating the mixing of liquid anesthetic and a respiratory gas for patients. 4,587,966, Cl. 128-202.220.

Albright, Harold D., Jr.; and Rollins, William R. Hybrid power system for driving a motor vehicle. 4,588,040, Cl. 180-165.000.

Alcatel Thomson Faisceaux Hertziens: *See—*
de Corlieu, Patrick; and Bursztejn, Jacques, 4,588,956, Cl. 330-2.000.

Aldrich, Ralph E., to Itek Corporation. Tip-tilt mirror actuation system having simplified driver circuitry. 4,588,268, Cl. 350-607.000.

Alexander, Delores J.: *See—*
Kordomenos, Panagiotis I.; Kurple, Kenneth R.; and Alexander, Delores J., 4,588,787, Cl. 525-440.000.

Alexander, Kenneth G.: *See—*
Braddock, Richard M.; and Alexander, Kenneth G., 4,588,002, Cl. 141-18.000.

Alexander Packaging Equipment Pty Ltd.: *See—*
Braddock, Richard M.; and Alexander, Kenneth G., 4,588,002, Cl. 141-18.000.

Alexander, William J., III. Tension control for web handling apparatus. 4,588,931, Cl. 318-7.000.

Alexandrov, Adolf M.; Volyansky, Igor I.; Yashin, Jury A.; and Tsernes, Vladimir Y. Device for starting and braking containers and locking them after they are stopped. 4,588,330, Cl. 406-83.000.

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Aliouste, Ali, to Regie Nationale des Usines Renault. Device for damping the vibrations of a flexible clutch in wet conditions, notably for torque converter. 4,588,058, Cl. 192-106.200.

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Allen, Arthur A. Container assembly for storing toxic material. 4,588,088, Cl. 206-525.000.

Allen, Charles F.: *See—*
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Allenson, Stephan J.; and Wagner, Stephen D., to Nalco Cehmical Company. Bimodal cationics for water clarification. 4,588,508, Cl. 210-708.000.

Allhands, Daniel R.: *See—*
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Allied Corporation: *See—*
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Nathasingh, Davidson M.; Datta, Amitava; Martis, Ronald J. J.; and DeCristofaro, Nicholas J., 4,588,452, Cl. 148-108.000.
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Alperin, Michael E.: *See—*
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American Dental Association Health Foundation: *See—*
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American Hoechst Corporation: *See—*
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Baasner, Bernd; Klauke, Erich; and Lantzsch, Reinhard, to Bayer Aktiengesellschaft. Process for the preparation of fluorocarboxylic acids. 4,588,837, Cl. 562-605.000.
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Baker, Edward B. Zero phase shift filtering. 4,589,135, Cl. 381-100.000.
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Gross, R. Michael, 4,587,849, Cl. 73-644.000.

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Degner, Dieter, 4,588,482, Cl. 204-59.00R.
Lange, Arno; and Wuerzer, Bruno, 4,588,434, Cl. 71-100.000.
Mueller, Herbert; and Palm, Christof, 4,588,827, Cl. 549-509.000.
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Schmolka, Irving R., 4,588,581, Cl. 424-45.000.
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Frentrup, Mark A.; Hirozawa, Stanley T.; Carson, James E.; and Coker, Daniel E., 4,588,511, Cl. 252-32.70E.
Basore, Wayne, to Worldsbest Industries, Inc. Removably-supported hamper bag and support for same. 4,588,154, Cl. 248-99.000.
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Babij, Tadeusz M.; and Bassen, Howard, 4,588,993, Cl. 343-351.000.
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Battenfeld Maschinenfabriken GmbH: *See—*
Holzschuh, Johann, 4,588,365, Cl. 425-183.000.
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Schultze, Lawrence E.; Bauer, Donald J.; and Arington, Ronald M., 4,588,565, Cl. 423-179.500.
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Baughman, Gary M., to Rieke Corporation. Closure construction having back-up support means. 4,588,103, Cl. 220-288.000.
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Bonner, Stanley V.; and Baumann, Frederic F., 4,587,698, Cl. 29-33.00A.
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Baur, Rupert; Dietel, Klaus; Stockler, Kurt; and Tauchert, Klaus, to Kienzle Apparate GmbH. Information processing mechanism with combined printing and reading device. 4,589,143, Cl. 382-61.000.
Bausch, Alfred, to Black & Decker Inc. Reversing switch arrangement for an electric tool. 4,588,910, Cl. 310-50.000.
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Harms, Wolfgang; Franke, Gunter; and Wunderlich, Klaus, 4,588,810, Cl. 544-76.000.
Heiker, Fred R.; Muller, Lutz; Puls, Walter; and Bischoff, Hilmar, 4,588,710, Cl. 514-25.000.
Ingendoh, Axel; Meyer, Horst; and Garthoff, Bernward, 4,588,723, Cl. 514-231.000.
Kadelka, Jurgen; and Schwarz, Hans-Helmut, 4,588,833, Cl. 560-145.000.
Kysela, Ernst; and Klauke, Erich, 4,588,844, Cl. 568-41.000.
Meyer, Karl-Heinrich; Heine, Diez; Alfes, Franz; and Eisermann, Wolfgang, 4,588,809, Cl. 528-500.000.
Petersen, Uwe; Grohe, Klaus; Zeiler, Hans-Joachim; and Metzger, Karl G., 4,588,726, Cl. 514-254.000.
Schmitt, Hans-Georg; Lurssen, Klaus; and Wedemeyer, Karlfried, 4,588,433, Cl. 71-98.000.
Scholl, Thomas; Preuss, Reinhard; Lachmann, Burkhard; Lower, Hartmut; and Muller, Peter R., 4,588,807, Cl. 528-272.000.
Thoma, Wilhelm; Pedain, Josef; Schroer, Walter; and Kling, Waldemar, 4,588,761, Cl. 524-38.000.
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Kanngiesser, Karl W., 4,588,428, Cl. 62-99.000.
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Riondel, Pierre, 4,588,932, Cl. 318-52.000.
Schroder, Gunther; and Singer, Robert, 4,588,552, Cl. 419-19.000.
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Morley, John G., 4,588,013, Cl. 164-16.000.
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Ferris, Michael J., 4,588,749, Cl. 514-649.000.
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Pietsch, Hanns; Hohmann, Volker; and Kluck, Detlef, 4,588,583, Cl. 424-81.000.
Beifuss, Wolfgang; Haussmann, Bernd; Pomper, Michael; and Soutschek, Ewald, to Siemens Aktiengesellschaft. Data processing system. 4,589,086, Cl. 364-760.000.
Beisser, Jean-Claude, to Societe Nouvelle Transfix. Electric transformer with annular coil forms. 4,588,971, Cl. 336-5.000.
Bekker, Vladimir; Buchheim, Wayne J.; Vanderlinde, William; and Wang, Donald S. T., to Monsanto Company. Polyvinyl halide polymer composition and shaped articles produced therefrom. 4,588,776, Cl. 525-81.000.
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Kreisher, John H.; Belle Isle, Hal D.; and Nalbantian, Charles A., 4,588,491, Cl. 204-299.00R.
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Benedetto, Alfred P., Jr. Modular hand cart. 4,588,197, Cl. 280-47.180.
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Jones, Frank; Reed, David A.; Crompton, Jane A.; and Beramendi, Pedro M., 4,588,514, Cl. 252-98.000.
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Berges, Hanns-Peter; and Leier, Wolfgang, to Leybold-Heraeus GmbH. Oil circuit coupler for an oil-sealed vacuum pump. 4,588,504, Cl. 210-234.000.

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Bernard, Gilbert: *See*—
Mailliet, Pierre; Bernard, Gilbert; and Calmes, Marc, 4,588,168, Cl. 266-81.000.

Bernardson, Peter S., to GTE Communication Systems Corporation. Residue to analog converter. 4,588,980, Cl. 340-347.0DA.

Bernbaum, L. Harrison. Collapsible article or luggage. 4,588,056, Cl. 190-107.000.

Bernstein, Joel E., to Jaye-Boern Laboratories, Inc. Method of treating keratosis and compositions useful therefor. 4,588,590, Cl. 424-195.100.

Berry, C. Bernard, Jr., to Ethyl Corporation. Method of preparing acyloxybenzenesulfonic acids and salts thereof. 4,588,533, Cl. 260-402.000.

Bertagna, Richard A.; and Ruiz, Rudolfo M., to Avicom International, Inc. Headset. 4,588,868, Cl. 179-156.00R.

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Bessler, Terry R., to A. E. Staley Manufacturing Company. Treatment of vegetable oils. 4,588,745, Cl. 514-552.000.

Beyer, Karl-Heinz: *See*—
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Bielicki, Michael D. Fastening device. 4,587,788, Cl. 52-698.000.

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Abbott, Jerry J.; Bierschbach, James E.; Bobo, Keith N.; and Herring, Greg S., 4,589,080, Cl. 364-552.000.

Bildl, Erich; Dietl, Josef; Baueregger, Rolf; and Seifert, Dieter, to Heliotronic Forschungs-und Entwicklungsgesellschaft fur Solarzellen-Grundstoffe mbH. Process for the purification of silicon by the action of an acid. 4,588,571, Cl. 423-348.000.

Billy, Jean C. Multiplexer, demultiplexer and multiplexing-demultiplexing equipment with reconfigurable frames. 4,589,108, Cl. 370-84.000.

Bilz, Reiner, to Otto Bilz, Werkzeugfabrik. Tool holder for a cutting machine provided with numerical control. 4,588,339, Cl. 409-234.000.

Bingham, Elton C.: *See*—
Groves, William A.; Harwood, Vance R.; Fay, Thomas R.; Bingham, Elton C.; and Teska, Michael A., 4,588,945, Cl. 324-158.00R.

Birjukova, Tamara G.: *See*—
Molodnyakov, Sergei P.; Fedorov, Jury I.; Kuznetsov, Vitaly A.; Egorochkin, Alexei N.; Birjukova, Tamara G.; and Razuvaev, Grigory A., 4,588,671, Cl. 430-191.000.

Bisacchi, Gregory S.; and Koster, William H., to E. R. Squibb & Sons, Inc. Acetylenic antibiotics. 4,588,828, Cl. 549-548.000.

Bischoff, Hilmar: *See*—
Heiker, Fred R.; Muller, Lutz; Puls, Walter; and Bischoff, Hilmar, 4,588,710, Cl. 514-25.000.

Bishop, Robert; and Schwenke, Derek, to Beltronics, Inc. Method of and apparatus for real-time high-speed inspection of objects for identifying or recognizing known and unknown portions thereof, including defects and the like. 4,589,140, Cl. 382-8.000.

Bjorling, Gotthard: *See*—
Eriksson, Sune; and Bjorling, Gotthard, 4,588,436, Cl. 75-10.00R.

Black & Decker Inc.: *See*—
Bausch, Alfred, 4,588,910, Cl. 310-50.000.
O'Brien, Lawrence B.; Winston, Walter F.; Abner, Edmund L.; Atkinson, Lowell G.; Roudebush, H. Richard; Buehler, William L.; Berastresser, Jim K.; and Messick, Walker A., 4,588,318, Cl. 401-146.000.

Blackledge, Mick: *See*—
Winch, Peter C.; and Blackledge, Mick, 4,587,805, Cl. 60-234.000.

Blackmer, David E.; and Townsend, James H., Jr., to Kintek, Inc. Signal decoding system. 4,589,129, Cl. 381-21.000.

Blanchard, Gilbert; and Frauck, Jean-Pierre, to Societe Francais des Produits pour Catalyse Pro-Catalyse chez Institut Francais du Petrole. Process for the catalytic reforming or aromatic hydrocarbons production. 4,588,497, Cl. 208-138.000.

Blaschke, Gunter; Reng, Alwin; and Quack, Jochen M., to Hoechst Aktiengesellschaft. Betaine-amine oxides, a process for their preparation and their use as surfactants. 4,588,522, Cl. 252-547.000.

Blauhut, Wilfried T., to Chemie Linz Aktiengesellschaft. Method for the radial compression of cylindrical bodies composed of compressible material. 4,587,895, Cl. 100-3.000.

Blaw-Knox Corporation: *See*—
Eibe, Werner W., 4,587,823, Cl. 72-206.000.

Blichasz, Charles S.; Gutter, David H.; and Michael, George W., III, to AMP Incorporated. Coaxial cable tap connector. 4,588,249, Cl. 339-97.00P.

Bliss, Dan E.: *See*—
McManis, George E., III; Fletcher, Aaron N.; and Bliss, Dan E., 4,588,662, Cl. 429-52.000.

Blizzard, William A., to Camco, Incorporated. Expandable metal seal for a well tool. 4,588,029, Cl. 166-120.000.

Blizzard, William A., to Camco, Incorporated. Well tool having a metal seal and bi-directional lock. 4,588,030, Cl. 166-120.000.

Block, Hans-Jurgen: *See*—
Hagemann, Fritz; Block, Hans-Jurgen; Hancke, Gustav; and Muss, Manfred, 4,587,979, Cl. 131-110.000.

Blohm & Voss AG: *See*—
Fernandez-Acebal, Jose ; Herm, Jurgen; Tomsen, Harald; and Wilms, Walter, 4,588,119, Cl. 225-2.000.

Blomquist, James E.; and Wilczewski, Robert H. Dot matrix print head. 4,587,724, Cl. 29-602.00R.

Blomstrand, Jan; Johansson, Anders; Junkrans, Sigvard; Nylund, Olov; and van Santen, Aart, to Aktiebolaget ASEA-ATOM. Fuel assembly for a boiling water reactor. 4,588,550, Cl. 376-438.000.

Blower, Warren A.; and Hermes, Rudolf, to Osborn Manufacturing Corporation. Foundry molding apparatus and method. 4,588,014, Cl. 164-29.000.

Blumenthal, Robert N.; and Melville, Andreas T. Hot gas measuring probe. 4,588,493, Cl. 204-410.000.

BMD Badische Maschinenfabrik Durlach GmbH: *See*—
Damm, Norbert; and Kobel, Alfons, 4,588,017, Cl. 164-169.000.

Bobo, Keith N.: *See*—
Abbott, Jerry J.; Bierschbach, James E.; Bobo, Keith N.; and Herring, Greg S., 4,589,080, Cl. 364-552.000.

Bock, Jurgen; Gloyer, Gerd; Richter, Horst; and Felkei, Roland, to ERNO-Raumfahrttechnik GmbH. Docking device for space vehicle. 4,588,150, Cl. 244-161.000.

Boden, Richard M.; and Grim, Claude, to International Flavors & Fragrances Inc. Use of norbornyl pyridine derivatives in augmenting or enhancing the aroma of tobacco and in flavored tobacco composition. 4,587,981, Cl. 131-278.000.

Boden, Richard M.; and McGhie, Joseph A., to International Flavors & Fragrances Inc. Methyl phenethyl acetal of 2-butynal, process for preparing same and organoleptic uses thereof. 4,588,521, Cl. 252-522.00R.

Boehm, Peter; and Wagner, Wilfried, to ITT Industries, Inc. Vacuum-operated brake power booster. 4,587,885, Cl. 91-376.00R.

Boehringer Ingelheim KG: *See*—
Esser, Franz; Koppe, Herbert; Abele, Wolfgang; and Stockhaus, Klaus, 4,588,736, Cl. 514-392.000.

Boeing Company, The: *See*—
Cologna, Rudy L.; Eng, Melvin D.; and King, Edgar P., 4,588,626, Cl. 428-63.000.
Thomas, Teddy R.; Sommer, David L.; and Von Bokern, Greg J., 4,589,074, Cl. 364-483.000.

Boeters, Bauer & Partner: *See*—
Pfleiderer, Peter M., 4,589,128, Cl. 381-17.000.

Boge GmbH: *See*—
Moser, Bernd, 4,587,850, Cl. 73-658.000.

Bohmer, Branislav; Lange, Werner; and Hohl, Frank, to Wolff Walsrode AG. Water-soluble, polymer-modified hydroxyalkyl methyl cellulose and its use as an additive for asbestos-free tile adhesive formulations. 4,588,772, Cl. 525-54.230.

Bohmer, Friedhelm, to SMS Schloemann-Siemag Aktiengesellschaft. Roll head for a planetary crossrolling mill. 4,587,820, Cl. 72-78.000.

Boiko, Rudolf; and Ulrich, Gunter, to Pelikan AG. Process for the production of a ball point pen cartridge. 4,587,999, Cl. 141-1.000.

Boliard, Gregory A. Volleyball practice gloves. 4,587,673, Cl. 2-161.00A.

Boliden Aktiebolag: *See*—
Malmqvist, Erik L.; and Kristiansson, Krister, 4,587,847, Cl. 73-432.00R.

Bolleter, Ulrich; and Schaad, Werner, to Sulzer Brothers Limited. Vibration-insulating and vibration-damping suspension for a weaving machine. 4,587,995, Cl. 139-1.00R.

Bollfrass, Charles A.; and Chelette, Kenneth D., to Thread Technology International, Inc. Threaded pipe connection. 4,588,213, Cl. 285-187.000.

Bollinger, John G.; Zik, John J.; and Duffie, Neil A. Self-guided welding machine. 4,588,872, Cl. 219-124.340.

Bolz, Alfred. Conical screw mixer. 4,588,301, Cl. 366-287.000.

Bone, David P.; Brophy, Kathryn M.; Champion, Robert M.; Meschewski, Robert J.; and McKinney, Craig W., to Quaker Oats Company, The. Ready-to-eat cereals. 4,588,596, Cl. 426-290.000.

Bonnemann, Helmut, to Studiengesellschaft Kohle mbH. Method for manufacturing pyridine and pyridine derivatives from alkynes and cyano compounds in the presence of complex cobalt or rhodium compounds with ligands containing boron. 4,588,815, Cl. 546-250.000.

Bonner, Stanley V.; and Baumann, Frederic F., to Foster Wheeler Energy Corporation. Scarfing method and apparatus. 4,587,698, Cl. 29-33.00A.

Boogaart, Abraham V. D.: *See—*
Van Gils, Adrianus W.; and Boogaart, Abraham V. D., 4,588,035, Cl. 175-48.000.

Booher, Dale R.: *See—*
Prikkel, John, III; and Booher, Dale R., 4,587,706, Cl. 29-513.000.

Borg-Warner Chemicals, Inc.: *See—*
Federl, Alan R.; and Kipouras, George P., 4,588,773, Cl. 525-64.000.

Boris, Alfred, to Hoffmann-La Roche Inc. Therapeutic compositions for reducing sebum secretion. 4,588,750, Cl. 514-765.000.

Bosshart, George S.: *See—*
Matarese, Alfred P.; and Bosshart, George S., 4,588,607, Cl. 427-34.000.

Boston, Edward P.; and Gibson, Robert L. Wire holder. 4,588,153, Cl. 248-74.200.

Botbol, Joseph M.; and Evenden, Gerald I. Emergency synthesized voice generator method and apparatus. 4,589,132, Cl. 381-51.000.

Botka, Julius K.: *See—*
Donecker, S. Bruce; and Botka, Julius K., 4,588,970, Cl. 333-22.00R.

Bott, John A. Cross rail for vehicle luggage carrier. 4,588,117, Cl. 224-321.000.

Bournonville, Jean-Paul: *See—*
Franck, Jean-Pierre; and Bournonville, Jean-Paul, 4,588,495, Cl. 208-65.000.

Bouwer, Sandra D.: *See—*
Wissman, Lance R.; Bouwer, Sandra D.; and Jeluso, Cheryl L., 4,587,983, Cl. 132-73.000.

Bowen, Rafael L., to American Dental Association Health Foundation. Multi-step method for obtaining strong adhesive bonding of composites to dentin, enamel and other substrates. 4,588,756, Cl. 523-116.000.

Bowers, John E.: *See—*
Tur, Moshe; Goodman, Joseph W.; Shaw, Herbert J.; Moslehi, Behzad; and Bowers, John E., 4,588,255, Cl. 350-96.160.

Brabb, James D.; and Simpson, Dennis L., to White Castle System, Inc. Combined chute and variable rate control assembly for a broadcast spreader. 4,588,133, Cl. 239-681.000.

Bracco Industria Chimica S.p.A.: *See—*
Felder, Ernst; and Zingales, Maria, deceased, 4,588,574, Cl. 423-554.000.

Brackett, George E., to Maxaxam Corporation. Apparatus and method for machining an enveloping-type worm screw. 4,588,337, Cl. 409-48.000.

Braddock, Richard M.; and Alexander, Kenneth G., to Alexander Packaging Equipment Pty Ltd. Hot melt adhesive applicator system. 4,588,002, Cl. 141-18.000.

Bradlee, Charles R., to Monarch Machine Tool Company, The. Tension leveling apparatus. 4,587,822, Cl. 72-163.000.

Brake, Anthony J., to Chiron Corporation. α-Factor and its processing signals. 4,588,684, Cl. 435-68.000.

Brandt, David E.: *See—*
Young, Ronald L.; Rock, Eugene F.; and Brandt, David E., 4,588,226, Cl. 297-349.000.

Brannstrom, Martin; and Wahlstam, Hans. Ethyl acetate as solvent in cavity liners. 4,588,763, Cl. 524-77.000.

Brauch, Ulrich: *See—*
Pejas, Wolfram; Liehmann, Jorg; and Brauch, Ulrich, 4,588,881, Cl. 235-385.000.

Braun, Bernd, to Intermedient GmbH. Process for producing a vessel prosthesis. 4,588,461, Cl. 156-143.000.

Braun, Ernst: *See—*
Braun, Gert; and Braun, Ernst, 4,588,072, Cl. 198-735.000.

Braun, Gert; and Braun, Ernst, to Halbach & Braun. Scraper chain conveyor trough with reinforcing plate. 4,588,072, Cl. 198-735.000.

Braun, Hans-Jurgen: *See—*
Konrad, Eugen; Braun, Hans-Jurgen; and Mager, Herbert, 4,588,410, Cl. 8-421.000.

Bray, George A.: *See—*
Greenway, Frank L., III; and Bray, George A., 4,588,724, Cl. 514-250.000.

Brede, Uwe: *See—*
Bertram, Friedrich; Brede, Uwe; and Kordel, Gerhard, 4,587,903, Cl. 102-216.000.

Brega, Angelo, to Mec-Mor S.p.A. Electronically controlled circular knitting machine. 4,587,812, Cl. 66-232.000.

Breining, Tibor: *See—*
Hermecz, Istvan; Vasvari nee Debreczy, Lelle; Horvath, Agnes; Kokosi, Jozsef; Virag, Sandor; and Breining, Tibor, 4,588,526, Cl. 260-243.300.

Brelan S.A.: *See—*
Leurent, Ghislain, 4,587,776, Cl. 52-86.000.

Brems, John H. Workpiece clamping mechanism for multiple station transfer machines utilizing rotary drive. 4,588,067, Cl. 198-345.000.

Brems, John H. Follower mechanism and control for rotary metal removing tools. 4,588,338, Cl. 409-124.000.

Brennan, Eric L.; and Schawel, Kenneth W., to Home Health Care of America, Inc. Pharmaceutical infusion products and the process and apparatus for the making thereof. 4,587,793, Cl. 53-425.000.

Brennan, John J.; Chyung, Kenneth; and Taylor, Mark P., to United Technologies Corporation. High strength, thermally stable magnesium aluminosilicate glass-ceramic matrix-sic fiber composites. 4,588,699, Cl. 501-9.000.

Brennan, William R. Sorting apparatus. 4,588,107, Cl. 221-112.000.

Bricot, Claude: *See—*
Volleau, Patrick; Bricot, Claude; Audouin, Michel; Leterme, Dominique; and Le Merer, Jean P., 4,589,102, Cl. 369-46.000.

Bridgestone Corporation: *See—*
Kitazawa, Yoichi; and Kikutsugi, Toshiharu, 4,588,009, Cl. 152-209.00R.
Ogawa, Masaki; and Shiomura, Yasuro, 4,588,645, Cl. 428-447.000.

Bright & Morning Star Company: *See—*
Sheiman, David M., 4,588,259, Cl. 350-132.000.

Brissette, Lawrence P., to General Motors Corporation. Closure panel hinge assembly. 4,587,760, Cl. 49-252.000.

Bristol-Myers Company: *See—*
Crenshaw, Ronnie R.; and Algieri, Aldo A., 4,588,826, Cl. 349-491.000.
Weinstein, Jack, 4,588,320, Cl. 401-213.000.

British Broadcasting Corporation: *See—*
Chambers, John P., 4,589,109, Cl. 370-94.000.

British Nuclear Fuels plc: *See—*
Tyson, Joseph H.; Kennett, Leslie P.; and Davidson, Iain S., 4,588,376, Cl. 432-36.000.

Brockhaus, Donald B.; Fuehrer, Calvin L.; Swartz, Walter E.; and Sietmann, Vernon H., to Stormor, Inc. Grain drying bin. 4,587,893, Cl. 98-55.000.

Brockley, Richard C. Spacer/protector for stacking recorded 33 rpm records. 4,589,104, Cl. 369-291.000.

Brooks, James S., to Phifer Wire Products, Inc. Woven shade screen. 4,587,997, Cl. 139-420.00R.

Brophy, Kathryn M.: *See—*
Bone, David P.; Brophy, Kathryn M.; Champion, Robert M.; Meschewski, Robert J.; and McKinney, Craig W., 4,588,596, Cl. 426-290.000.

Brosh, James: *See—*
Sjogren, Kaj; and Brosh, James, 4,587,751, Cl. 37-142.00R.

Brouse, S. Bernard; and Wiedel, John, to United States Steel Corporation. Edge protector positioning apparatus. 4,587,791, Cl. 53-128.000.

Brown, Boveri & Cie Aktiengesellschaft: *See—*
Hausen, Marek, 4,587,819, Cl. 72-9.000.

Brown, James; Ellis, Peter E.; and Draper, Marta J., to Nabisco Brands, Inc. Cold water soluble gelatin. 4,588,602, Cl. 426-576.000.

Brown, Richard A.: *See—*
Raymond, Richard L.; Brown, Richard A.; Norris, Robert D.; and O'Neill, Eugene T., 4,588,506, Cl. 210-606.000.

Brown, Ronald O.; and Delorme, Ernest J., to Alslur Enterprises Limited; and Contran Manufacturing (1982) Limited. Cement mixing process and apparatus. 4,588,299, Cl. 366-8.000.

Browne, Leslie J., to Ciba-Geigy Corporation. Certain imidazo(1,5-a)pyridine derivatives and their use as thromboxane synthetase inhibitors. 4,588,732, Cl. 514-300.000.

Broyhill Company, The: *See—*
Broyhill, Roy F.; and Broyhill, Craig G., 4,588,128, Cl. 239-168.000.

Broyhill, Craig G.: *See—*
Broyhill, Roy F.; and Broyhill, Craig G., 4,588,128, Cl. 239-168.000.

Broyhill, Roy F.; and Broyhill, Craig G., to Broyhill Company, The. Folding boom for agricultural sprayers. 4,588,128, Cl. 239-168.000.

Brugger, Kurt, to Scarnato, Franco. Hair washing basin or bowl for hairdressers. 4,587,680, Cl. 4-519.000.

Bruno, Claudio: *See—*
Tonon, Thomas; Bruno, Claudio; and Leshner, Michael D., 4,588,373, Cl. 431-328.000.

Brunson, Amber N., to Brunson Instrument Company. Infrared collimator. 4,588,253, Cl. 350-1.100.

Brunson Instrument Company: *See—*
Brunson, Amber N., 4,588,253, Cl. 350-1.100.

Brush, Robert W., Sr.: *See—*
Schildkraut, Alan L.; and Brush, Robert W., Sr., 4,588,246, Cl. 339-89.00R.

Bryant, Raymond A.: *See—*
Adams, Peter I.; Bryant, Raymond A.; and Knapman, William, 4,587,982, Cl. 131-336.000.

Bucher, Doris J.; Khan, Mohamed W.; and Kharitonenkov, Igor G., to Mount Sinai School of Medicine of the City University of New York. Assay for viruses. 4,588,680, Cl. 435-5.000.

Buchheim, Wayne J.: *See—*
Bekker, Vladimir; Buchheim, Wayne J.; Vanderlinde, William; and Wang, Donald S. T., 4,588,776, Cl. 525-81.000.

Buchner, Alfred; Kuhn-Kuhnenfeld, Franz; and Auer, Walter, to Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH. Process for the backside-gettering surface treatment of semiconductor wafers. 4,587,771, Cl. 51-281.0SF.

Buckler, Robert. Waterless lithographic plate processor. 4,588,277, Cl. 354-317.000.

Budai, Zoltan; Kis-Tamas, Attila; Lay nee Konya, Aranka; Vig, Zoltan; Andriska, Viktor; and Mezei, Tibor, to EGYT Gyogyszervegyeszeti Gyar. N-substituted amino propane sulfonic acid derivatives and plant growth regulating use. 4,588,435, Cl. 71-103.000.

Buddy L Corporation: *See—*
Kennedy, Melvin R.; Nagel, Dietmar; and Arad, Abraham A., 4,588,386, Cl. 446-6.000.

Buderus Aktiengesellshaft: *See—*
Giebmanns, Karl, 4,587,767, Cl. 51-101.00R.

Buehler Ltd.: *See—*
Doyle, Ralph R., 4,587,768, Cl. 51-124.00R.

Buehler, William L.: *See—*
O'Brien, Lawrence B.; Winston, Walter F.; Abner, Edmund L.; Atkinson, Lowell G.; Roudebush, H. Richard; Buehler, William L.; Berastresser, Jim K.; and Messick, Walker A., 4,588,318, Cl. 401-146.000.

Buennagel, James A. Remote load data acquisition and control system for a power network. 4,589,075, Cl. 364-492.000.

Buhler, Eugen; Strobel, Klaus; and Schwarzmeier, Karl, to Buhler, Eugen; and Hutschenreuther AG. Apparatus for producing molded articles from a pourable compound. 4,588,368, Cl. 425-546.000.

Bull, Randy A., to FMC Corporation. Oxidation of unsaturated organic compounds with hydrogen peroxide. 4,588,845, Cl. 568-771.000.

Bulso, Joseph D., Jr.; and McClung, James A., to Redicon Corporation. Shell reforming method and apparatus. 4,587,825, Cl. 72-329.000.

Bulso, Joseph D., Jr.; and McClung, James A., to Redicon Corporation. Container end panel forming method and apparatus. 4,587,826, Cl. 72-329.000.

Bunel, Gerard; Levy, Jean-Paul; and Martinez, Christian, to Compagnie Francaise de Raffinage. Container body of the composite type and container comprising said body. 4,588,621, Cl. 428-35.000.

Bunnell Life Systems, Inc.: *See—*
Usry, Joe; Atkins, Roger; and Faddis, Chris, 4,588,425, Cl. 55-227.000.

Burberry, Lee M.: *See—*
Bailey, David C.; and Burberry, Lee M., 4,588,887, Cl. 250-236.000.

Burg, Donald E. Fine entry air ride boat hull. 4,587,918, Cl. 114-67.00A.

Burger, Laurie J.; Protzmann, Donald E.; and Uhl, Robert F., to Chesebrough-Pond's Inc. Electronic thermometer probe assembly. 4,588,306, Cl. 374-158.000.

Burgkhardt, Bertram: *See—*
Piesch, Ernst; and Burgkhardt, Bertram, 4,588,898, Cl. 250-390.000.

Burke, Steven A.; and Pali, Christopher, to Essex Group, Inc. Roll transfer robot. 4,588,344, Cl. 414-225.000.

Burkhart, Joseph P.; and Holbert, Gene W., to Merrell Dow Pharmaceuticals Inc. Intermediates for the synthesis of 4-amino-4,5-dihydro-2-furancarboxylic acid. 4,588,825, Cl. 549-475.000.

Burnham, Robert; Holonyak, Nick, Jr.; and Chung, Harlan F., to Xerox Corporation. Wavelength tuning of quantum well heterostructure lasers using an external grating. 4,589,115, Cl. 372-20.000.

Burroughs Corp.: *See—*
Priscott, Daniel R., 4,588,884, Cl. 250-223.00R.
White, Paul K., 4,588,177, Cl. 269-41.000.

Burroughs, Van C.: *See—*
Hyde, Patrick C.; and Burroughs, Van C., 4,588,509, Cl. 210-788.000.

Burroughs Wellcome Co.: *See—*
Ferris, Robert M., 4,588,728, Cl. 514-255.000.

Burson, Bob O., to R. E. Phelon Company. Breakerless ignition system and method of manufacture thereof. 4,587,942, Cl. 123-599.000.

Bursztejn, Jacques: *See—*
de Corlieu, Patrick; and Bursztejn, Jacques, 4,588,956, Cl. 330-2.000.

Burton, Jack D.; and Tyrrell, F. Peter, to Ricoh Company Ltd. Method and apparatus for interrupting a facsimile transmission. 4,589,033, Cl. 358-257.000.

Bush, Darrell C., to Western Geophysical Company of America. Method for mounting poorly consolidated core samples. 4,587,857, Cl. 73-863.000.

Bushnell, Nolan K.: *See—*
Milner, Ronald E.; and Bushnell, Nolan K., 4,589,138, Cl. 381-110.000.

Bussey, Marlin G.: *See—*
Mientus, Bernard S.; Fields, William G.; and Bussey, Marlin G., 4,588,650, Cl. 428-516.000.

Butler, Joseph W.; and Jarvis, Edward E., to Coal Industry (Patents) Limited. Conveyor belt tension sensing. 4,587,852, Cl. 73-826.000.

Butler, Michael B.: *See—*
Walker, Charles B.; Hori, Roy Y.; and Butler, Michael B., 4,587,964, Cl. 128-92.00E.

Butter, Stephen A.; and Stoll, Ilse, to Air Products and Chemicals, Inc. Synthesis of neoalkanols. 4,588,848, Cl. 568-885.000.

Butti Pocket Ashtray Company, Ltd.: *See—*
Tipper, Frank, 4,587,980, Cl. 131-235.100.

Buxton, James L., to Drexler Technology Corporation. Skew detection system for optically read data. 4,588,882, Cl. 235-487.000.

Byrd, Norman R., to McDonnell Douglas Corporation. Diurea and diguanidine phosphinates and phosphonates. 4,588,838, Cl. 564-14.000.

Byrne, Frank, to United States of America, National Aeronautics and Space Administration. Method and apparatus for operating on companded PCM voice data. 4,588,986, Cl. 340-347.0DD.

Byrum, Ronnie L.: *See—*
Fiscus, Walter J.; and Byrum, Ronnie L., 4,588,619, Cl. 428-31.000.

Bytow, Peter, to Trumpf GmbH & Co. Machine tool center with multipurpose robot assembly for loading and unloading tooling and workpieces from machine tool. 4,587,716, Cl. 29-568.000.

C & H Printing, Inc.: *See—*
Lulay, Lawrence O.; and Nichols, Steven F., 4,588,291, Cl. 355-77.000.

C-I-L Inc.: *See—*
Sanz, Delio, 4,588,022, Cl. 165-1.000.

Cahill, Richard F.; and Udd, Eric, to McDonnell Douglas Corporation. Compact optical gyro. 4,588,296, Cl. 356-350.000.

Caille, Michel, to Laiteries Hubert Triballat. Process for producing a rolled cheese. 4,588,597, Cl. 426-297.000.

Calabrese, John. Stretching apparatus. 4,588,186, Cl. 272-126.000.

Calgaro, Honore ; and Grossiord, Claude, to S. T. Dupont. Device for controlling the flowrate of a liquefied-gas lighter. 4,588,374, Cl. 431-344.000.

Calgon Carbon Corporation: *See—*
Rosene, Michael R., 4,587,953, Cl. 127-46.200.

Calmes, Marc: *See—*
Mailliet, Pierre; Bernard, Gilbert; and Calmes, Marc, 4,588,168, Cl. 266-81.000.

Camco, Incorporated: *See—*
Blizzard, William A., 4,588,029, Cl. 166-120.000.
Blizzard, William A., 4,588,030, Cl. 166-120.000.

Cameron, Ewen R.; Yardley, Robert; and Wolloff, Frank H., to USM Corporation. Adhesive supplying system. 4,588,109, Cl. 222-63.000.

Cameron, T. Jay: *See—*
Bertschy, John R.; Cameron, T. Jay; Deckert, Kenneth L.; and Lee, Sylvia L., 4,589,036, Cl. 360-75.000.

Campbell, Eugene: *See—*
Berlin, Frank; McGuire, Leonard; and Campbell, Eugene, 4,587,674, Cl. 2-195.000.

Campbell, Henry F.: *See—*
Studt, William L.; Kuhla, Donald E.; and Campbell, Henry F., 4,588,719, Cl. 514-212.000.

Camper Delight Sales Corp.: *See—*
Haglund, Allen, 4,587,948, Cl. 126-38.000.

Canon Kabushiki Kaisha: *See—*
Hosono, Nagao; Nagase, Yukio; Takeuchi, Tatsuo; Egami, Hidemi; and Satomura, Hiroshi, 4,589,053, Cl. 361-213.000.
Kazumi, Jiro, 4,588,274, Cl. 354-105.000.
Nagata, Toru, 4,588,273, Cl. 354-21.000.
Nakasugi, Mikio; Yokomatsu, Takao; and Isohata, Junji, 4,588,288, Cl. 355-53.000.
Nakata, Kazuo; Hosoya, Jun; Ohshima, Shigeru; and Sekiguchi, Takeshi, 4,589,015, Cl. 358-55.000.
Ogawa, Hiroshi; Toriumi, Mototada; and Onoda, Shigeyoshi, 4,588,280, Cl. 355-3.00R.
Tamura, Yasuyuki, 4,588,990, Cl. 340-792.000.
Tokuhara, Mitsuhiro, 4,588,283, Cl. 355-14.00E.
Tsuji, Sadahiko, 4,589,031, Cl. 358-227.000.
Yokomizo, Yoshikazu, 4,589,034, Cl. 358-234.000.

Cantin, Donald W. Multi-use watercraft. 4,587,917, Cl. 114-61.000.

Capps, David B., to Warner-Lambert Company. Pyrazolo[3,4,5-k]acridine compositions and methods for their use as antimicrobials. 4,588,730, Cl. 514-287.000.

Caputo, Jeffrey C.: *See—*
Caputo, Mario A.; and Caputo, Jeffrey C., 4,588,076, Cl. 206-86.000.

Caputo, Mario A.; and Caputo, Jeffrey C. Smokers convenience caddy. 4,588,076, Cl. 206-86.000.

Caracciolo, Francesco. Universal pin for oral implantoprosthesis. 4,588,381, Cl. 433-173.000.

Caray, Andree ; and Loizeau, Pierre, to Valeo. Torsion damping assembly for automotive friction clutch plate. 4,588,062, Cl. 192-106.200.

Carborundum Abrasives Company: *See—*
Caul, Lawrence D.; and Forsyth, Paul F., 4,588,419, Cl. 51-295.000.

Card, Joseph L.: *See—*
Card, Roy T.; and Card, Joseph L., 4,587,914, Cl. 112-266.200.

Card, Roy T.; and Card, Joseph L. Tufting machine and method of preventing sew through and tagging in producing a tufted product. 4,587,914, Cl. 112-266.200.

Cardiac Pacemakers, Inc.: *See—*
Salo, Rodney W.; and Pederson, Brian D., 4,587,975, Cl. 128-693.000.

Cardinal, Earl V. Method for generating hydrogen. 4,588,577, Cl. 423-657.000.

Carl Still GmbH & Co. K.G., Firma: *See—*
Weber, Heinrich; Lorenz, Kurt; and Dungs, Horst, 4,588,479, Cl. 202-228.000.

Carl-Zeiss-Stiftung: *See—*
Kurbitz, Gunther, 4,588,895, Cl. 250-551.000.

Carle & Montanari S.p.A.: *See—*
Cerboni, Renzo, 4,588,599, Cl. 426-515.000.

Carrasquel, Angel R.: *See—*
Morales, Alfredo L.; Galiasso, Roberto; Carrasquel, Angel R.; and Salazar, Jose A., 4,588,709, Cl. 502-314.000.

Carre, Jean-Jacques; and Levrai, Roland, to Societe Anonyme D.B.A. Volumetric screw compressor. 4,588,363, Cl. 418-201.000.

Carrier Corporation: *See—*
Zinsmeyer, Thomas M., 4,589,060, Cl. 364-148.000.

Carruthers, James D.: *See—*
Beck, H. Wayne; Carruthers, James D.; Cornelius, Edward B.; Kmecak, Ronald A.; Kovach, Stephen M.; and Hettinger, William P., Jr., 4,588,702, Cl. 502-65.000.

Carson, James E.: *See—*
Frentrup, Mark A.; Hirozawa, Stanley T.; Carson, James E.; and Coker, Daniel E., 4,588,511, Cl. 252-32.70E.

Carter, John L.; and Wegman, Mark N., to International Business Machines Corporation. Polynomial hashing. 4,588,985, Cl. 340-347.0DD.

Carter, Nicholas J. R.; and Sutherland, Douglas, to ITT Corporation. Small key telephone system. 4,588,864, Cl. 179-99.00H.

Carter, Nicholas J. R.: *See—*
Middleton, Francisco A.; Das, Santanu; and Carter, Nicholas J. R., 4,589,107, Cl. 370-62.000.

Casne, Thomas F.: *See—*
Monahan, John F.; Hacke, Joseph F.; and Casne, Thomas F., 4,589,025, Cl. 358-213.000.

Cassella Aktiengesellschaft: *See—*
Keil, Karl-Heinz; Engelhardt, Fritz; Greiner, Ulrich; Sternberger, Klaus; and Pelster, Manfred, 4,588,413, Cl. 8-543.000.

Castagnoli, Rinaldo, to De la Rue Giori S.A. Document of value. 4,588,212, Cl. 283-91.000.

Castel, John C., to Physio Technology, Inc. Tissue and bone regeneration. 4,587,957, Cl. 128-1.300.

Cathers, William P., to PPG Industries, Inc. Grinding wheel wear compensation system. 4,587,769, Cl. 51-165.870.

Caul, Lawrence D.; and Forsyth, Paul F., to Carborundum Abrasives Company. Resin systems for high energy electron curable resin coated webs. 4,588,419, Cl. 51-295.000.

Cavero, Icilio; and Langer, Salomon Z., to Synthelabo. 1,2,3,4-tetrahydronaphthalene derivatives used as antiglaucoma agents. 4,588,747, Cl. 514-630.000.

Ceca, Felix L.: *See—*
Santurtun, Carlos M.; Ceca, Felix L.; and Benegoechea, Jose M. Q., 4,589,051, Cl. 361-88.000.

Celanese Corporation: *See—*
Chung, Tai-Shung; Furst, Howard; Gurion, Zev; McMahon, Paul E.; Orwoll, Richard D.; and Palangio, Daniel, 4,588,538, Cl. 264-29.200.
David, Lawrence D., 4,588,575, Cl. 423-594.000.
David, Lawrence D., 4,588,576, Cl. 423-608.000.
Maxwell, Peter C., 4,588,688, Cl. 435-142.000.
Ward, Bennett C., 4,588,808, Cl. 528-337.000.

Center Engineering, Inc.: *See—*
Harrison, Leonard, 4,588,178, Cl. 269-234.000.

Centre de Recherche Industrielle du Quebec: *See—*
Le Dinh, Chon T.; and Leblanc, Andre , 4,589,083, Cl. 364-724.000.

Cerboni, Renzo, to Carle & Montanari S.p.A. Method of casting chocolate. 4,588,599, Cl. 426-515.000.

Cetus Corporation: *See—*
Mark, David F.; Lin, Leo S.; and Yu Lu, Shi-Da, 4,588,585, Cl. 424-85.000.

Cha, Dae Y., to Upjohn Company, The. Mercury removal process. 4,588,529, Cl. 260-397.400.

Chambers, John P., to British Broadcasting Corporation. Multiplexed digital data transmission. 4,589,109, Cl. 370-94.000.

Chambers, Warren D.: *See—*
Anderson, Bruce W.; and Chambers, Warren D., 4,587,888, Cl. 92-13.600.

Champion, Robert M.: *See—*
Bone, David P.; Brophy, Kathryn M.; Champion, Robert M.; Meschewski, Robert J.; and McKinney, Craig W., 4,588,596, Cl. 426-290.000.

Champion Spark Plug Europe S.A.: *See—*
Verton, Jose; and Guerard, Norbert, 4,587,685, Cl. 15-250.420.

Champlin, Charles L.; and Olson, Arthur A., Jr., to Packaging Corporation of America. Carrier handle. 4,588,077, Cl. 206-193.000.

Chang, Eugene Y. C., to American Cyanamid Company. Polyurethanes based on polyether blends. 4,588,802, Cl. 528-58.000.

Chang, Wen-Hsuan, to PPG Industries, Inc. Amide-containing polyhydroxyethyl carbamates. 4,588,783, Cl. 525-329.900.

Charvat, Vernon K., to Superior Finishers, Inc. Methods of manufacturing abrasive articles. 4,588,420, Cl. 51-298.000.

Chavdarian, Charles G.: *See—*
Haag, William G.; and Chavdarian, Charles G., 4,588,714, Cl. 514-114.000.

Chavy, Pierre P. R.; and Legrand, Jean-Claude, to Conforglace S.A. Flame-resisting glazing panels. 4,587,784, Cl. 52-304.000.

Chelette, Kenneth D.: *See—*
Bollfrass, Charles A.; and Chelette, Kenneth D., 4,588,213, Cl. 285-187.000.

Chem-tronics, Incorporated: *See—*
Gross, Donald W., 4,588,474, Cl. 156-659.100.

Chemie Linz Aktiengesellschaft: *See—*
Blauhut, Wilfried T., 4,587,895, Cl. 100-3.000.

Chemische Werke Huls Aktiengesellschaft: *See—*
Bax, Hanns-Jorg; Horlbeck, Gernot; Feldmann, Rainer; and Mumcu, Salih, 4,588,785, Cl. 525-419.000.

Chen, Chin-Lin. Toilet flushing device. 4,587,679, Cl. 4-388.000.

Chen, Jong J.: *See—*
Yao, Jame; Chen, Jong J.; and Elliot, Douglas G., 4,588,427, Cl. 62-17.000.

Chen, Tzu L. Device for towing luggage. 4,588,055, Cl. 190-18.00A.

Chenevas-Paule, Andre ; and Diem, Bernard, to Commissariat a l'Energie Atomique. Process for the manufacture of a self-aligned thin-film transistor. 4,587,720, Cl. 29-578.000.

Cherne Industries, Inc.: *See—*
Nelson, Dale K.; and Mathison, Allen D., 4,588,110, Cl. 222-135.000.

Cherney, Thomas M.: *See—*
Onstott, James R.; Cronk, Bryon J.; and Cherney, Thomas M., 4,588,256, Cl. 350-96.210.

Cherry-Burrell Corporation: *See—*
Evans, James W.; Scheid, John P.; and Eichinger, Daniel R., 4,588,391, Cl. 493-165.000.

Chesebrough-Pond's Inc.: *See—*
Burger, Laurie J.; Protzmann, Donald E.; and Uhl, Robert F., 4,588,306, Cl. 374-158.000.

Chessin, Hyman; and Newby, Kenneth R., to M&T Chemicals Inc. Chromium plating bath for producing non-iridescent, adherent, bright chromium deposits at high efficiencies and substantially free of cathodic low current density etching. 4,588,481, Cl. 204-51.000.

Chevron Research Company: *See—*
Jordan, Roland H., 4,588,501, Cl. 210-109.000.
Klukdahl, Harris E., 4,588,566, Cl. 423-179.500.
Spatz, David M., 4,588,735, Cl. 514-357.000.

Chiang, Robert L.; Perigard, Raymond G.; and Rabo, Jule A., to Union Carbide Corp. Catalytic cracking catalysts. 4,588,701, Cl. 502-65.000.

Chiba, Takashi; Koga, Satoru; and Senda, Minji, to Fujitsu Limited. System for controlling key storage unit which controls access to main storage. 4,589,064, Cl. 364-200.000.

Chicopee: *See—*
Shimalla, Charles J., 4,588,630, Cl. 428-131.000.

Child, Robin E., to Concentric Pumps Limited. Reversible unidirectional flow rotary pump. 4,588,362, Cl. 418-32.000.

Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt: *See—*
Hermecz, Istvan; Vasvari nee Debreczy, Lelle; Horvath, Agnes; Kokosi, Jozsef; Virag, Sandor; and Breining, Tibor, 4,588,526, Cl. 260-243.300.

Chinoin Gyogyszer Vegyeszeti Termekek Gyara Rt.: *See—*
Gyory, Peter; Galambos, Geza; Kanay, Karoly; Ivanics, Jozsef; Dorman, Gyorgy; Kovacs, Gabor; Stadler, Istvan; Virag, Sandor; Tomoskozi, Istvan; Kormoczky, Peter; and Kovacs, Marianna, 4,588,713, Cl. 514-63.000.

Chiron Corporation: *See—*
Brake, Anthony J., 4,588,684, Cl. 435-68.000.

Chiu, Jessie T., to Rockcor, Inc. Adhesive composition. 4,588,637, Cl. 428-355.000.

Chivari, Ilie. Shaft coupling. 4,588,388, Cl. 464-69.000.

Choi, Rack K.: *See—*
Kim, Joo H.; and Choi, Rack K., 4,588,232, Cl. 301-1.000.

Chorkey, William J. Valve with uniplanar flow. 4,587,991, Cl. 137-454.600.

Chou, Yu-Chia T., to Du Pont de Nemours, E. I., and Company. Process for separation of ethylene glycol and propylene glycol on selected zeolites. 4,588,847, Cl. 568-872.000.

Christensen, Norman B., to Dana Corporation. Valve stem travel limiting apparatus. 4,588,163, Cl. 251-285.000.

Christian, Donald J.; and Humm, Patrick A., to Texas Instruments Incorporated. Apparatus for automatically inspecting printed labels. 4,589,141, Cl. 382-14.000.

Christman, Donald L., to BASF Corporation. Polyurethane sealant compositions and their use as thermal-break sealants. 4,588,803, Cl. 528-78.000.

Chu, Raymond D.; Rubner, Anthony C.; and Bergman, Marc A., to Lifecare Services, Inc. Oxygen enriched reciprocating piston respirator. 4,587,967, Cl. 128-204.210.

Chubu Industries, Inc.: *See—*
Himi, Kohei, 4,588,135, Cl. 241-84.000.

Chugai Ro Co., Ltd.: *See—*
Yamamoto, Tadashi; Nagata, Masato; and Oba, Tomoyuki, 4,588,378, Cl. 432-59.000.

Chung, Harlan F.: *See—*
Burnham, Robert; Holonyak, Nick, Jr.; and Chung, Harlan F., 4,589,115, Cl. 372-20.000.

Chung, Tai-Shung; Furst, Howard; Gurion, Zev; McMahon, Paul E.; Orwoll, Richard D.; and Palangio, Daniel, to Celanese Corporation. Process for preparing tapes from thermoplastic polymers and carbon fibers. 4,588,538, Cl. 264-29.200.

Chuo Denshi Kabushiki Kaisha: *See—*
Sakai, Kenji; Wakabayashi, Takeshi; Fukuzawa, Kakumasa; and Hiraoka, Teruzo, 4,587,838, Cl. 73-116.000.

Chyung, Kenneth: *See—*
Brennan, John J.; Chyung, Kenneth; and Taylor, Mark P., 4,588,699, Cl. 501-9.000.

Ciba-Geigy Corporation: *See—*
Adam, Jean-Marie, 4,588,811, Cl. 544-128.000.
Browne, Leslie J., 4,588,732, Cl. 514-300.000.
Hugelshofer, Paul, 4,588,412, Cl. 8-524.000.
Scheibli, Peter; Kanzig, Alex; and Schaub, Andres, 4,588,411, Cl. 8-528.000.
Watthey, Jeffrey W. H., 4,588,746, Cl. 514-554.000.

Ciciliani, Patrice: *See—*
Fourrey, Francois; and Ciciliani, Patrice, 4,588,172, Cl. 267-89.000.

Citizen Watch Company Limited: *See—*
Ebihara, Heihachiro, 4,589,097, Cl. 365-185.000.

Cito-Pac Verpackungsgesellschaft mbH: *See—*
Spuck, Gisbert; and Ludwig, Gerhard, 4,588,090, Cl. 206-532.000.

CKD Corporation: *See—*
Ogawa, Yukihiko; Kusumi, Saburo; Fukuda, Michio; Okunishi, Toshifumi; Miwa, Sinkichi; and Ohta, Yosinobu, 4,587,725, Cl. 29-753.000.

Clairol Incorporated: *See—*
Jachowicz, Janusz; and Wolfram, Leszek J., 4,588,760, Cl. 524-12.000.
Mack, William; and Matison, Gary G., 4,587,950, Cl. 126-263.000.

Clark, George B., to Dow Chemical Company, The. Support for tubesheets in hollow fiber permeators. 4,588,631, Cl. 428-166.000.

Clark, William E. Radar tracking system and display. 4,588,992, Cl. 343-10.000.

Clarke, Peter J.: *See—*
Ullman, Thomas J.; Shadbolt, Colin F.; Pagdin, Brian C.; Marriage, David J.; Clarke, Peter J.; and Sheppard, Ian J., 4,587,986, Cl. 137-1.000.

Clawson Machine Company, Inc.: *See—*
Fletcher, Charles J., 4,587,810, Cl. 62-3.000.

Clayson, Arthur E.; Bates, Jack; and Fulmer, Richard D., to United States of America, Navy. Depression gun pod. 4,587,881, Cl. 89-37.160.

Clemco Roll Forming, Inc.: *See—*
Doke, Jack; and Clemens, Forrest E., 4,588,156, Cl. 248-243.000.

Clemens, Forrest E.: *See—*
Doke, Jack; and Clemens, Forrest E., 4,588,156, Cl. 248-243.000.

Clement, Leonard W. H., to Cooper Canada Limited. Helmet face mask. 4,587,677, Cl. 2-424.000.

Cloud, Ernest. Trap hauler and ejector. 4,588,166, Cl. 254-266.000.

CMT Industries, Inc.: *See—*
Currey, Larry B., 4,587,921, Cl. 114-363.000.

Coal Industry (Patents) Limited: *See—*
Butler, Joseph W.; and Jarvis, Edward E., 4,587,852, Cl. 73-826.000.

Cocke, John: *See—*
Auslander, Marc A.; Cocke, John; Hao, Hsieh T.; Markstein, Peter W.; and Radin, George, 4,589,065, Cl. 364-200.000.
Auslander, Marc A.; Cocke, John; Hao, Hsieh T.; Markstein, Peter W.; and Radin, George, 4,589,087, Cl. 364-768.000.

Coe, Thomas U. Substrate and media carrier. 4,588,086, Cl. 206-444.000.

Coester, Oskar H. W. Pneumatic propulsion system for car and passenger vehicles. 4,587,906, Cl. 104-156.000.

Coffey, Gerald P.: *See—*
Curatolo, Benedict S.; and Coffey, Gerald P., 4,588,797, Cl. 526-225.000.

Cogswell, John; and Fokos, Robert F., to Sun Chemical Corporation. Apparatus and method for folding cut sheet paper. 4,588,393, Cl. 493-440.000.

Cohen, Donald K.; and Yardy, Raymond, to International Business Machines Corporation. An adjustable-optical prism with integral-polarizing beam splitter and applications thereof. 4,588,263, Cl. 350-401.000.

Cohen, Joseph; and Lorthioir, Gerard, to Pechiney. Process for the production of a metal by electrolyzing halides in a molten salt bath, comprising a simultaneous and continuous double deposit. 4,588,485, Cl. 204-64.00R.

Cohen, Sam G., to Timex Computer Corporation. Automatic line impedance balancing circuit for computer/telephone communications interface. 4,588,856, Cl. 179-2.00C.

Coker, Daniel E.: *See—*
Frentrup, Mark A.; Hirozawa, Stanley T.; Carson, James E.; and Coker, Daniel E., 4,588,511, Cl. 252-32.70E.

Coker, Earnest Z. Gravity flow amalgamator. 4,588,499, Cl. 209-189.000.

Colburn, Kenneth. Ski boot buckle tool. 4,587,870, Cl. 81-15.900.

Coleman, Edward P., Jr.: *See—*
Prince, John S.; Herz, Harold L.; and Coleman, Edward P., Jr., 4,589,022, Cl. 358-168.000.

Coles Cranes Limited: *See—*
Murta, Raymond, 4,588,347, Cl. 414-685.000.

Collins, James D., to Rowe International, Inc. Universal document validator. 4,588,292, Cl. 356-71.000.

Collins, Roy S., to Triman Limited. Studded footwear. 4,587,748, Cl. 36-127.000.

Cologna, Rudy L.; Eng, Melvin D.; and King, Edgar P., to Boeing Company, The. Blind-side panel repair patch. 4,588,626, Cl. 428-63.000.

Coma Julia, Concepcion. Measuring device for medicinal products in powder or granular form. 4,587,846, Cl. 73-426.000.

Combet, Michel, to Envirotech Corporation. Turret for roof bolting apparatus. 4,588,037, Cl. 175-220.000.

Commissariat a l'Energie Atomique: *See—*
Auchapt, Pierre; Sablier, Robert; Symard, Jose ; and Seyfried, Philippe, 4,588,524, Cl. 252-626.000.
Chenevas-Paule, Andre ; and Diem, Bernard, 4,587,720, Cl. 29-578.000.
Saudray, Didier; and Auchapt, Pierre, 4,588,507, Cl. 210-695.000.

Compagnie Francaise de Raffinage: *See—*
Bunel, Gerard; Levy, Jean-Paul; and Martinez, Christian, 4,588,621, Cl. 428-35.000.

Compagnie Industrielle des Telecommunications Cit-Alcatel: *See—*
Saulgeot, Claude, 4,588,361, Cl. 417-424.000.

Concentric Pumps Limited: *See—*
Child, Robin E., 4,588,362, Cl. 418-32.000.

Concrete Safety Equipment, Inc.: *See—*
Silay, Louis E.; Stein, James S.; and Kunzweiler, John J., 4,588,231, Cl. 299-39.000.

Confer, Merle A., to Roll Form Products, Inc. Electrical trench grommet member. 4,588,853, Cl. 174-48.000.

Conforglace S.A.: *See—*
Chavy, Pierre P. R.; and Legrand, Jean-Claude, 4,587,784, Cl. 52-304.000.

Connolly, Douglas P.; Swistak, Gregory B.; and Tannascoli, Robert J., to Xerox Corporation. Closed loop mechanical development control system. 4,587,929, Cl. 118-657.000.

Conrad, Ulrich. Bridoon bit. 4,587,797, Cl. 54-8.000.

Conradi, Robert A.: *See—*
Anderson, Bradley D.; and Conradi, Robert A., 4,588,718, Cl. 514-172.000.

Conroy, Ernest F., Jr.: *See—*
Maiden, Charles W.; Conroy, Ernest F., Jr.; and Dorman, John G., 4,588,065, Cl. 198-323.000.

Contran Manufacturing (1982) Limited: *See—*
Brown, Ronald O.; and Delorme, Ernest J., 4,588,299, Cl. 366-8.000.

Cook, Alfred W., to Varian Associates, Inc. Coaxial magnetron using the TE_{111} mode. 4,588,965, Cl. 331-91.000.

Cook, Ronald, to Tools & Machinery Builders, Inc. Continuous adhesive applicator. 4,587,925, Cl. 118-211.000.

Coombes, Graham E.; and Lemoine, Austin J. Seismic trigger. 4,587,859, Cl. 74-2.000.

Cooper Canada Limited: *See—*
Clement, Leonard W. H., 4,587,677, Cl. 2-424.000.

Cooper Industries, Inc.: *See—*
West, David G., 4,587,987, Cl. 137-70.000.

Cooper, Raymond: *See—*
Meyers, Edward; and Cooper, Raymond, 4,588,588, Cl. 424-122.000.

Copenhafer, William C.: *See—*
Cyran, Michael J.; and Copenhafer, William C., 4,588,569, Cl. 423-244.000.

Cordis Corporation: *See—*
Sussman, Marvin L., 4,588,085, Cl. 206-438.000.

Cornelius, Edward B.: *See—*
Beck, H. Wayne; Carruthers, James D.; Cornelius, Edward B.; Kmecak, Ronald A.; Kovach, Stephen M.; and Hettinger, William P., Jr., 4,588,702, Cl. 502-65.000.

Costales, Mark J.: *See—*
Reifschneider, Walter; Paroonagian, Doris L.; Costales, Mark J.; and DeVries, Donald H., 4,588,711, Cl. 514-86.000.

Costruzioni Aeronautiche Giovanni Agusta S.p.A.: *See—*
Pariani, Emilio, 4,588,356, Cl. 416-140.000.

Courbot, Pierre, to Societe Anonyme D.B.A. Drum brake. 4,588,052, Cl. 188-79.50P.

Courvoisier, Guy; and Arieh, Simon, to Lange International S.A. Ski boot into which the foot is introduced from the rear. 4,587,747, Cl. 36-117.000.

Cowan, Kiplin D.; Pierce, Dale E.; and Nowlin, Oscar D., to Phillips Petroleum Company. Polyolefin polymerization process and catalyst. 4,588,703, Cl. 502-111.000.

Cozzi, Paolo; Pillan, Antonio; and Lovisolo, Pier P., to Farmitalia Carlo Erba S.p.A. N-imidazolyl derivatives of 1,2,3,4-tetrahydro-naphthalene and indan as platelet aggregation inhibitors. 4,588,738, Cl. 514-399.000.

Crane, Lawrence: *See—*
Kelly, Michael; Mammato, Donald C.; Durham, Dana; Jain, Sangya; and Crane, Lawrence, 4,588,670, Cl. 430-165.000.

Crawford, Michael E.: *See—*
Magee, Arthur W.; Shockley, Richard D.; and Crawford, Michael E., 4,588,460, Cl. 156-96.000.

Crenshaw, Ronnie R.; and Algieri, Aldo A., to Bristol-Myers Company. Ethanediimidamide intermediates. 4,588,826, Cl. 349-491.000.

Crenshaw, Susan L. H.; Schlintz, Neal L.; and Moore, Danny R., to Procter & Gamble Company, The. Two-ply nonwoven fabric laminate. 4,588,457, Cl. 156-62.800.

Crompton, Jane A.: *See—*
Jones, Frank; Reed, David A.; Crompton, Jane A.; and Beramendi, Pedro M., 4,588,514, Cl. 252-98.000.

Cronk, Bryon J.: *See—*
Onstott, James R.; Cronk, Bryon J.; and Cherney, Thomas M., 4,588,256, Cl. 350-96.210.

Crosby Valve & Engineering Company Limited: *See—*
Hewlett, Kelvin J. R., 4,587,836, Cl. 73-49.800.

Crossman, James A.: *See—*
Edwards, Douglas C.; and Crossman, James A., 4,588,780, Cl. 525-184.000.

Crucible Materials Corporation: *See—*
Narasimhan, Kalathur S. V. L.; Willman, Carol J.; and Dulis, Edward J., 4,588,439, Cl. 75-123.00B.

Crupi, Raymond F.: *See—*
Vasques, Anthony J.; and Crupi, Raymond F., 4,587,777, Cl. 52-108.000.

Cummins Engine Company, Inc.: *See—*
Shaw, Terrence M., 4,587,933, Cl. 123-41.670.

Cunliffe, William J.; Eady, Elizabeth A.; and Holland, Keith T. Antibiotic compounds, process for the preparation and pharmaceutical compositions thereof, methods of treatment therewith and Staphylococcus bacteria. 4,588,692, Cl. 435-253.000.

Cuomo, Jerome J.; Kaufman, Harold R.; and Rossnagel, Stephen M., to International Business Machines Corporation. Hollow cathode enhanced magnetron sputter device. 4,588,490, Cl. 204-298.000.

Curatolo, Benedict S.; and Coffey, Gerald P., to Standard Oil Company, The. Composition comprising amide, lithium halide and organic sulfone. 4,588,797, Cl. 526-225.000.

Curbishley, George; and Hoppin, George S., III, to Garrett Corporation, The. Method for manufacturing a dual alloy cooled turbine wheel. 4,587,700, Cl. 29-156.80R.

Currey, Larry B., to CMT Industries, Inc. Mounting for boating equipment. 4,587,921, Cl. 114-363.000.

Curulla, Michael V.: *See—*
Matzner, Bruce; Horn, Victor M.; Curulla, Michael V.; and Price, John F., 4,587,704, Cl. 29-446.000.

Cutler, John H.; and Stallard, Loyal N., to General Electric Company. Method and apparatus for the protection of a thyristor power conversion system. 4,589,050, Cl. 361-86.000.

Cycles Peugeot: *See—*
Fourrey, Francois; and Ciciliani, Patrice, 4,588,172, Cl. 267-89.000.

Cyran, Michael J.; and Copenhafer, William C., to Intermountain Research & Development Corporation. Dry injection flue gas desulfurization process using absorptive soda ash sorbent. 4,588,569, Cl. 423-244.000.

Daido, Yoshimasa: *See*—
Saito, Toshiyuki; Tokumitsu, Yasuyuki; Okubo, Naofumi; Daido, Yoshimasa; and Kurihara, Hiroshi, 4,588,962, Cl. 330-286.000.

Daiichi Dentsu Kabushiki Kaisha: *See*—
Doniwa, Tabito, 4,587,839, Cl. 73-117.200.

Daikin Kogyo Co., Ltd.: *See*—
Ohmori, Akira; Tomihashi, Nobuyuki; and Shimizu, Yoshiki, 4,588,781, Cl. 525-200.000.

Dainippon Plastics Co., Ltd.: *See*—
Hotta, Masahiro, 4,588,777, Cl. 525-93.000.

Dainippon Screen Mfg. Co., Ltd.: *See*—
Shoda, Mikio; Oka, Masahiko; and Nishida, Masami, 4,588,185, Cl. 271-267.000.

Daiwa Seiko, Inc.: *See*—
Hirano, Kazuo, 4,588,140, Cl. 242-84.20R.

dal Ri, Heinz: *See*—
Meyer, Georg; and dal Ri, Heinz, 4,587,977, Cl. 128-777.000.

Damm, Norbert; and Kobel, Alfons, to BMD Badische Maschinenfabrik Durlach GmbH. Apparatus for compacting molding sand using pressurized gas. 4,588,017, Cl. 164-169.000.

Damon, Robert E., II, to Sandoz, Inc. Heptenoic acid derivatives. 4,588,715, Cl. 514-63.000.

Dana Corporation: *See*—
Antonini, Joseph; and Gallo, Paul E., 4,588,195, Cl. 277-153.000.
Christensen, Norman B., 4,588,163, Cl. 251-285.000.

Danico, Henry F., to TRW, Inc. Floor pan plug. 4,588,104, Cl. 220-326.000.

Daniel, John K.: *See*—
Bargar, Thomas M.; and Daniel, John K., 4,588,733, Cl. 514-302.000.

Daniele, Joseph J.; and Araghi, Mehdi N., to Xerox Corporation. LED printing array fabrication method. 4,587,717, Cl. 29-569.00L.

Darden, Jerome W.: *See*—
Triebel, Carol A.; Darden, Jerome W.; and Peterson, Edward S., 4,588,513, Cl. 252-75.000.

Das, Santanu: *See*—
Middleton, Francisco A.; Das, Santanu; and Carter, Nicholas J. R., 4,589,107, Cl. 370-62.000.

Data Probe Corporation: *See*—
Henley, Francois J., 4,588,950, Cl. 324-158.00R.

Datafile Limited: *See*—
Barber, Donald T.; and Walter, Erhard P., 4,588,463, Cl. 156-200.000.

Datta, Amitava: *See*—
Nathasingh, Davidson M.; Datta, Amitava; Martis, Ronald J. J.; and DeCristofaro, Nicholas J., 4,588,452, Cl. 148-108.000.

Daugherty, Charles W.; Khan, Mohammad A.; Lentz, David J.; and Thoresen, Stephen L., to Warner-Lambert Company. Catheter tip configuration. 4,588,398, Cl. 604-265.000.

David C. Mitchell Medical Research Institute: *See*—
Mitchell, David C., 4,588,717, Cl. 514-170.000.

David, Lawrence D., to Celanese Corporation. Production of microcrystalline metal oxides. 4,588,575, Cl. 423-594.000.

David, Lawrence D., to Celanese Corporation. Production of microcrystalline zirconia. 4,588,576, Cl. 423-608.000.

Davidson, Iain S.: *See*—
Tyson, Joseph H.; Kennett, Leslie P.; and Davidson, Iain S., 4,588,376, Cl. 432-36.000.

Davis, Helen: *See*—
Jayadev, Tumkur S.; Van Nguyen, On; Reyes, Jaime M.; Davis, Helen; and Putty, Michael W., 4,588,520, Cl. 252-512.000.

Davister, Armand L.; Dubreuco, Andre R.; and Thirion, Francis A., to Prayon Development. Method for the preparation of phosphoric acid and calcium sulphate. 4,588,570, Cl. 423-320.000.

DBX, Inc.: *See*—
Adams, Robert W., 4,588,979, Cl. 340-347.0AD.

De la Rue Giori S.A.: *See*—
Castagnoli, Rinaldo, 4,588,212, Cl. 283-91.000.

Deacon, George R.: *See*—
Anhalt, John W.; and Deacon, George R., 4,588,244, Cl. 339-75.00M.

Dean, Barry D., to Atlantic Richfield Company. Thermodynamically miscible polymer compositions. 4,588,774, Cl. 525-73.000.

Dearborn Chemical Company: *See*—
Kuhn, Vincent R., 4,588,519, Cl. 252-389.00R.

de Boer, Berend; and Doorduin, Karel J. Ear protector for keeping down sound and associated filter. 4,587,965, Cl. 128-152.000.

DeBruyn, William, to Amerock Corporation. Rotary shelf assembly with bearing assembly and detent mechanism. 4,587,908, Cl. 108-142.000.

Deckert, Kenneth L.: *See*—
Bertschy, John R.; Cameron, T. Jay; Deckert, Kenneth L.; and Lee, Sylvia L., 4,589,036, Cl. 360-75.000.

de Corlieu, Patrick; and Bursztejn, Jacques, to Alcatel Thomson Faisceaux Hertziens. Wide band amplifier-limiter device. 4,588,956, Cl. 330-2.000.

DeCristofaro, Nicholas J.: *See*—
Nathasingh, Davidson M.; Datta, Amitava; Martis, Ronald J. J.; and DeCristofaro, Nicholas J., 4,588,452, Cl. 148-108.000.

Deere & Company: *See*—
Thomas, Kenneth R.; and West, Neil L., 4,587,799, Cl. 56-14.600.

Degnan, Thomas F.; and Pelrine, Bruce P., to Mobil Oil Corporation. Hydroprocessing reactor for catalytically dewaxing liquid petroleum feedstocks. 4,588,560, Cl. 422-211.000.

Degner, Dieter, to BASF Aktiengesellschaft. Preparation of phthalaldehyde acetals. 4,588,482, Cl. 204-59.00R.

Degtev, Evgeny I.: *See*—
Fedorov, Svyatoslav N.; Egorova, Eleonora V.; Spiridonov, Oleg P.; Nanushian, Sergei R.; Benenson, Igor L.; Degtev, Evgeny I.; Masterov, Vyacheslav N.; and Kiselev, Vladimir G., 4,588,406, Cl. 623-6.000.

Degussa Aktiengesellschaft: *See*—
Domesle, Rainer; Koberstein, Edgar; Pletka, Hans-Dieter; and Volker, Herbert, 4,588,707, Cl. 502-225.000.

Deley, Theodore. Portable sawing device utilizing a circular power saw. 4,587,875, Cl. 83-471.300.

Dell, George H., to Wico Corporation. Port expansion adapter for video game port. 4,588,187, Cl. 273-1.00E.

Delorme, Ernest J.: *See*—
Brown, Ronald O.; and Delorme, Ernest J., 4,588,299, Cl. 366-8.000.

Del Pesco, Thomas W.: *See*—
Dicker, Ira B.; Farnham, William B.; Hertler, Walter R.; Laganis, Evan D.; Sogah, Dotsevi Y.; Del Pesco, Thomas W.; and Fitzgerald, Patrick H., 4,588,795, Cl. 526-192.000.

DeLuca, Hector F.; Ikekawa, Nobuo; and Tanaka, Yoko, to Wisconsin Alumni Research Foundation. 1,24-dihydroxy-Δ^{22}-vitamin D_3 and process for preparing same. 4,588,528, Cl. 260-397.200.

DeLuca, Hector F.; and Schnoes, Heinrich K., to Wisconsin Alumni Research Foundation. Method for treating metabolic bone disease in mammals. 4,588,716, Cl. 514-168.000.

DeMarco, Joseph P.: *See*—
Ruehl, William E.; and DeMarco, Joseph P., 4,588,152, Cl. 248-71.000.

DenBesten, Leroy E. Padded rail plate for tracked vehicles. 4,588,233, Cl. 305-51.000.

Denis, Philippe V.: *See*—
Schatteman, Etienne A. M.; and Denis, Philippe V., 4,589,101, Cl. 369-38.000.

Depta, Ingolf; and Kindler, Wilfried, to Siemens Aktiengesellschaft. Device for the fixing and contacting of piezotubes. 4,588,999, Cl. 346-140.00R.

de Reynal de Saint Michel, Olivier. Quick-meal restaurant installation. 4,588,047, Cl. 186-38.000.

Dern, Jean-Claude: *See*—
Giovachini, Jean-Luc; Varnier, Jean-Paul; Dern, Jean-Claude; Le Guet, Pierre-Loic; and Pascal, Jean-Pierre, 4,587,841, Cl. 73-148.000.

Dery, Ronald A.; and Jones, Warren C., to AMP Incorporated. Method of making adhesive electrical interconnecting means. 4,588,456, Cl. 156-52.000.

Designs Unlimited, Inc.: *See*—
Wilson, Dennis W., 4,587,814, Cl. 70-232.000.

Desmazeaud, Michel: *See*—
Barthelemy, Pierre; and Desmazeaud, Michel, 4,588,593, Cl. 426-36.000.

DeSoto, Inc.: *See*—
Kriz, Karel; and Minnis, Ralph L, 4,588,649, Cl. 428-511.000.
Minnis, Ralph L.; Moschovis, Elias P.; and Killeen, James J., 4,588,757, Cl. 523-406.000.

Desrochers, Gerard; Dubreuil, Louis; and Grumich, Joseph, to Hydro-Quebec. Continuous, undisturbed sampling by rotational boring in non-plastic granular tills. 4,588,036, Cl. 175-58.000.

Detlef Gneuss: *See*—
Zibell, Bodo; Patrovsky, Hubert; and Gneuss, Detlef, 4,588,502, Cl. 210-171.000.

Develco, Inc.: *See*—
Rorden, Louis H.; and Fraser, Edward C., 4,587,741, Cl. 33-366.000.

DeVries, Donald H.: *See*—
Reifschneider, Walter; Paroonagian, Doris L.; Costales, Mark J.; and DeVries, Donald H., 4,588,711, Cl. 514-86.000.

DeWitt, William J.: *See*—
Shepherd, Lawrence H., Jr.; DeWitt, William J.; and Kuehnhanss, Gerhard O., 4,588,534, Cl. 260-513.00R.

Dicker, Ira B.; Farnham, William B.; Hertler, Walter R.; Laganis, Evan D.; Sogah, Dotsevi Y.; Del Pesco, Thomas W.; and Fitzgerald, Patrick H., to Du Pont de Nemours, E. I., and Company. Oxyanion-catalyzed polymerization. 4,588,795, Cl. 526-192.000.

Dickinson, Thorn W.; and Geiger, Gilbert W., deceased (by Geiger, Dolores A., executrix), to Fafnir Bearing - Division of The Torrington Company. Antifriction bearing with removable thermally expandable and contractable seal means. 4,588,312, Cl. 384-482.000.

Diehl GmbH & Co.: *See*—
Lindner, Friedrich; and Kriz, Helmut, 4,587,902, Cl. 102-213.000.
Meisner, Alfred, 4,588,876, Cl. 200-35.00R.

Diem, Bernard: *See*—
Chenevas-Paule, Andre ; and Diem, Bernard, 4,587,720, Cl. 29-578.000.

Dietel, Klaus: *See*—
Baur, Rupert; Dietel, Klaus; Stockler, Kurt; and Tauchert, Klaus, 4,589,143, Cl. 382-61.000.

Dieter Graesslin Feinwerktechnik: *See*—
Thoma, Friedrich X., 4,588,304, Cl. 368-107.000.

Dietl, Josef: *See*—
Bildl, Erich; Dietl, Josef; Baueregger, Rolf; and Seifert, Dieter, 4,588,571, Cl. 423-348.000.

Dietrich, Klaus, to Messerschmitt-Bolkow-Blohm GmbH. Method and apparatus for optical data processing. 4,589,098, Cl. 365-215.000.

Diez, Donald E., to Minnesota Mining and Manufacturing Company. Film seal for container. 4,588,099, Cl. 215-232.000.

Digital Equipment Corporation: *See—*
Heinen, Roger J., Jr., 4,589,068, Cl. 364-300.000.

Dilling, George R., to Reed-Chatwood, Inc. Apparatus for applying treatment material to a textile material. 4,587,813, Cl. 68-22.00B.

Dischert, Robert A.; and Topper, Robert J., to RCA Corporation. Digital adder including counter coupled to individual bits of the input. 4,589,019, Cl. 358-160.000.

Disdier, Camille: *See—*
Moyne, Jose ; and Disdier, Camille, 4,588,532, Cl. 260-402.000.

DM International Inc.: *See—*
Yao, Jame; Chen, Jong J.; and Elliot, Douglas G., 4,588,427, Cl. 62-17.000.

Dobler, Klaus; and Grunwald, Werner, to Robert Bosch GmbH. Pressure sensor for installation in a wall element subjected to pressure of a fluid medium, such as a hydraulic pressure line, e.g. in diesel fuel injection systems. 4,587,840, Cl. 73-119.00A.

Doi, Ryota: *See—*
Shimizu, Toshio; Satoo, Takanori; Doi, Ryota; Yamaguchi, Motoo; Tsukui, Tsutomu; and Yoshioka, Yoshio, 4,588,660, Cl. 429-35.000.

Doke, Jack; and Clemens, Forrest E., to Clemco Roll Forming, Inc. Integral bracket support structure. 4,588,156, Cl. 248-243.000.

Dokiya, Masayuki: *See—*
Fujishige, Masao; Dokiya, Masayuki; Kameyama, Tetsuya; Yokokawa, Harumi; Ujiie, Seiichi; and Fukuda, Kenzo, 4,588,438, Cl. 75-68.00A.

Dolinar, Blair E., to Dow Chemical Company, The. Dunnage material. 4,588,638, Cl. 428-339.000.

Dolphin, John M., to Polaroid Corporation. Photographic system with quaternary releaser. 4,588,672, Cl. 430-218.000.

Domesle, Rainer; Koberstein, Edgar; Pletka, Hans-Dieter; and Volker, Herbert, to Degussa Aktiengesellschaft. Catalyst for the reduction of the ignition temperature of diesel soot filtered out of the exhaust gas of diesel engines. 4,588,707, Cl. 502-225.000.

Dominico, James, to Van Dam Machine Corporation. Bottom rim coater for intermittently operated container decorating apparatus. 4,587,926, Cl. 118-211.000.

Don Evans, Inc.: *See—*
Evans, Dale M., 4,588,094, Cl. 211-55.000.

Donaldson Company, Inc.: *See—*
Gillingham, Gary R.; and Rothman, James C., 4,588,423, Cl. 55-117.000.

Donecker, S. Bruce; and Botka, Julius K., to Hewlett-Packard Company. Three section termination for an R.F. triaxial directional bridge. 4,588,970, Cl. 333-22.00R.

Doniwa, Tabito, to Daiichi Dentsu Kabushiki Kaisha. Top dead center measurement for reciprocating crank mechanism. 4,587,839, Cl. 73-117.200.

Donnelly, Kevin A.: *See—*
McGinty, Joseph R.; and Donnelly, Kevin A., 4,588,468, Cl. 156-345.000.

Donovan, James G., to Albany International Corp. Synthetic down. 4,588,635, Cl. 428-288.000.

Doorduin, Karel J.: *See—*
de Boer, Berend; and Doorduin, Karel J., 4,587,965, Cl. 128-152.000.

Dorman, Gyorgy: *See—*
Gyory, Peter; Galambos, Geza; Kanay, Karoly; Ivanics, Jozsef; Dorman, Gyorgy; Kovacs, Gabor; Stadler, Istvan; Virag, Sandor; Tomoskozi, Istvan; Kormoczky, Peter; and Kovacs, Marianna, 4,588,713, Cl. 514-63.000.

Dorman, John G.: *See—*
Maiden, Charles W.; Conroy, Ernest F., Jr.; and Dorman, John G., 4,588,065, Cl. 198-323.000.

Dorman Smith Switchgear Limited: *See—*
Kidd, Alan L., 4,589,073, Cl. 364-483.000.

Dorsman, Adrian K., to Rockwell International Corporation. Clocked precision integrating analog-to-digital converter system. 4,588,984, Cl. 340-347.0NT.

Doty, Gerald A., to Gateway Industries, Inc. Free-falling, self-locking adjustable tip assembly. 4,588,207, Cl. 280-801.000.

Dougherty, John J., to General Electric Company. Digital I^2T pickup, time bands and timing control circuits for static trip circuit breakers. 4,589,052, Cl. 361-94.000.

Dow Chemical Company, The: *See—*
Clark, George B., 4,588,631, Cl. 428-166.000.
Dolinar, Blair E., 4,588,638, Cl. 428-339.000.
Fisk, Thomas E.; and Hoffman, Dwight K., 4,588,830, Cl. 556-52.000.
Gurgiolo, Arthur E., 4,588,840, Cl. 564-443.000.
Mendoza, Abel, 4,588,816, Cl. 546-301.000.
Mientus, Bernard S.; Fields, William G.; and Bussey, Marlin G., 4,588,650, Cl. 428-516.000.
Reifschneider, Walter; Paroonagian, Doris L.; Costales, Mark J.; and DeVries, Donald H., 4,588,711, Cl. 514-86.000.
Schmidt, Donald L.; Meyer, Louis W.; and Urchick, Demetrius, 4,588,643, Cl. 428-422.000.
Smith, David A., 4,588,070, Cl. 198-468.300.

Dow, Thurman: *See—*
Ring, David F.; Nashed, Wilson; and Dow, Thurman, 4,588,400, Cl. 604-304.000.

Downing, Curtis B.; Wilczek, Stephen P.; Ziehm, Richard T.; Federico, Anthony M.; Husted, Raymond R.; and Edmunds, Michael E., to Xerox Corporation. Remote processor crash recovery. 4,589,090, Cl. 364-900.000.

Doyle, Ralph R., to Buehler Ltd. Apparatus and method for polishing ends of fiber optics. 4,587,768, Cl. 51-124.00R.

Doyon, Jacques; and Doyon, Maurice. Mobile baking oven and proofer. 4,587,946, Cl. 126-20.000.

Doyon, Maurice: *See—*
Doyon, Jacques; and Doyon, Maurice, 4,587,946, Cl. 126-20.000.

Dragerwerk Aktiengesellschaft: *See—*
Albarda, Scato, 4,587,966, Cl. 128-202.220.

Drake, Charles A.; and Loffer, Bill, to Phillips Petroleum Company. Recovery of inert hydrocarbon diluents used in preparation of catalysts. 4,588,704, Cl. 502-111.000.

Draney, Robert G.: *See—*
Leonard, Emil T.; and Draney, Robert G., 4,588,034, Cl. 172-40.000.

Draper, Marta J.: *See—*
Brown, James; Ellis, Peter E.; and Draper, Marta J., 4,588,602, Cl. 426-576.000.

Drexler, Jerome, to Drexler Technology Corporation. Micrographic film member with laser written data. 4,588,665, Cl. 430-12.000.

Drexler Technology Corporation: *See—*
Buxton, James L., 4,588,882, Cl. 235-487.000.
Drexler, Jerome, 4,588,665, Cl. 430-12.000.

Dubois, Jean-Daniel: *See—*
Piguet, Albert; and Dubois, Jean-Daniel, 4,588,305, Cl. 368-185.000.

Dubreuco, Andre R.: *See—*
Davister, Armand L.; Dubreuco, Andre R.; and Thirion, Francis A., 4,588,570, Cl. 423-320.000.

Dubreuil, Louis: *See—*
Desrochers, Gerard; Dubreuil, Louis; and Grumich, Joseph, 4,588,036, Cl. 175-58.000.

Ducai, Viktor: *See—*
Eysn, Manfred; Ducai, Viktor; and Hohmann, Kurt, 4,588,169, Cl. 266-165.000.

Duchesneau, Jerome G.; and Schwartz, Robert A., to United Technologies Corporation. Engine speed control in propeller pitch control systems. 4,588,354, Cl. 416-27.000.

Duffie, Neil A.: *See—*
Bollinger, John G.; Zik, John J.; and Duffie, Neil A., 4,588,872, Cl. 219-124.340.

Dulis, Edward J.: *See—*
Narasimhan, Kalathur S. V. L.; Willman, Carol J.; and Dulis, Edward J., 4,588,439, Cl. 75-123.00B.

Dumoulin, Gilles: *See—*
Lebaron, Richard; and Dumoulin, Gilles, 4,588,114, Cl. 224-32.00A.

Dungs, Horst: *See—*
Weber, Heinrich; Lorenz, Kurt; and Dungs, Horst, 4,588,479, Cl. 202-228.000.

Dunn, Charles S.; and Seng, Stephen, to Owens-Corning Fiberglas Corporation. Electrode support mechanism and method. 4,589,119, Cl. 373-94.000.

Dunn, Michael R.: *See—*
Lind, Michael A.; and Dunn, Michael R., 4,587,732, Cl. 30-92.000.

Duplo Seizo Kabushiki Kaisha: *See—*
Sakata, Kei; Tanaka, Kazunori; and Aiuchi, Kazunori, 4,588,181, Cl. 271-121.000.

Du Pont de Nemours, E. I., and Company: *See—*
Chou, Yu-Chia T., 4,588,847, Cl. 568-872.000.
Dicker, Ira B.; Farnham, William B.; Hertler, Walter R.; Laganis, Evan D.; Sogah, Dotsevi Y.; Del Pesco, Thomas W.; and Fitzgerald, Patrick H., 4,588,795, Cl. 526-192.000.
Fryd, Michael, 4,588,804, Cl. 528-125.000.
Gabler, William A.; and Julian, Frank M., 4,588,418, Cl. 48-197.00R.
Heitner, Barry J., 4,588,798, Cl. 526-228.000.
Hillemann, Craig L., 4,588,432, Cl. 71-92.000.
Kilkson, Henn, 4,588,401, Cl. 604-408.000.
Wheland, Robert C., 4,588,796, Cl. 526-214.000.

DuPont-Mitsui Polychemicals Co., Ltd.: *See—*
Kutsuwa, Yoshikazu; Kitahara, Kouji; and Ishii, Toshiyuki, 4,588,855, Cl. 174-120.0SC.

Duprez, Wayne R., to Standard-Thomson Corporation. Pressure compensated temperature switch unit for protection of an internal combustion engine. 4,587,931, Cl. 123-41.150.

Durham, Dana: *See—*
Kelly, Michael; Mammato, Donald C.; Durham, Dana; Jain, Sangya; and Crane, Lawrence, 4,588,670, Cl. 430-165.000.

Duvall, Donovan S.: *See—*
Salyer, Ival O.; Griffen, Charles W.; and Duvall, Donovan S., 4,588,510, Cl. 252-5.000.

Dynamic Disk, Inc.: *See—*
Wray, Daniel X., 4,588,653, Cl. 428-600.000.

Dynamit Nobel Aktiengesellschaft: *See—*
Bertram, Friedrich; Brede, Uwe; and Kordel, Gerhard, 4,587,903, Cl. 102-216.000.

Dynatrend, Incorporated: *See—*
Massa, Ronald J.; Ellis, Theodore R.; and LePage, Robert G., 4,589,081, Cl. 364-554.000.

E. J. Brooks Company: *See—*
Guiler, Richard S.; and Farbaniec, Peter, 4,588,218, Cl. 292-307.00R.

E. R. Squibb & Sons, Inc.: *See—*
Bisacchi, Gregory S.; and Koster, William H., 4,588,828, Cl. 549-548.000.
Haslanger, Martin F.; Varma, Ravi K.; and Hall, Steven E., 4,588,743, Cl. 514-469.000.

Meyers, Edward; and Cooper, Raymond, 4,588,588, Cl. 424-122.000.
Nakane, Masami, 4,588,741, Cl. 514-443.000.
Nakane, Masami, 4,588,742, Cl. 514-443.000.
Thottathil, John K., 4,588,819, Cl. 548-532.000.

Eady, Elizabeth A.: *See—*
Cunliffe, William J.; Eady, Elizabeth A.; and Holland, Keith T., 4,588,692, Cl. 435-253.000.

Earl & Wright: *See—*
Lewis, Roger E.; and Hayes, Webb W., Jr., 4,587,775, Cl. 52-65.000.

East, Gary P.: *See—*
Schulte, Rudolf R.; East, Gary P.; and Heindle, Alfons, 4,588,394, Cl. 604-9.000.

Eastman Kodak Company: *See—*
Abbas, Daniel C., 4,588,883, Cl. 250-205.000.
Abbas, Daniel C., 4,588,896, Cl. 250-213.00A.
Goodhue, Charles T.; Kydd, Gwendolyn C.; Foster, Charles H.; and McCombs, Charles A., 4,588,683, Cl. 435-59.000.
Kessler, David, 4,588,269, Cl. 350-619.000.

Eaton Corporation: *See—*
Urban, John A., 4,588,050, Cl. 188-73.100.

Eaton, Homer L., to Vektronics Manufacturing, Inc. Tape laying method and apparatus. 4,588,466, Cl. 156-235.000.

Ebara Corporation: *See—*
Shibata, Tomoyuki; and Nakayama, Mitsuhito, 4,588,353, Cl. 415-197.000.

Ebb Tide Pty., Ltd.: *See—*
Rorke, Andrew J., 4,587,780, Cl. 52-187.000.

Ebihara, Heihachiro, to Citizen Watch Company Limited. Non-volatile memory circuit having a common write and erase terminal. 4,589,097, Cl. 365-185.000.

Economove Corporation: *See—*
Rodriguez, Saulo V., 4,588,048, Cl. 187-8.670.

Eddy, Arthur R., Jr.: *See—*
Mruk, Norbert J.; Vaughan, Raymond C.; and Eddy, Arthur R., Jr., 4,588,762, Cl. 524-45.000.

Edmunds, Michael E.: *See—*
Downing, Curtis B.; Wilczek, Stephen P.; Ziehm, Richard T.; Federico, Anthony M.; Husted, Raymond R.; and Edmunds, Michael E., 4,589,090, Cl. 364-900.000.

Edwards, Douglas C.; and Crossman, James A., to Polysar Limited. Fibre containing polymers and process for production thereof. 4,588,780, Cl. 525-184.000.

Effland, Richard C.; Klein, Joseph T.; and Hamer, R. Richard L., to Hoechst-Roussel Pharmaceuticals Inc. Intermediates for pyrrolo[1,2-b][1,2,5]triazepines. 4,588,727, Cl. 514-255.000.

Egami, Hidemi: *See—*
Hosono, Nagao; Nagase, Yukio; Takeuchi, Tatsuo; Egami, Hidemi; and Satomura, Hiroshi, 4,589,053, Cl. 361-213.000.

Egerdahl, Raymond H. Combined drop and broadcast spreader for granular material. 4,588,113, Cl. 222-626.000.

Egloff, Anton; and Kohler, Lothar, to Maschinenfabrik Sulzer-Ruti AG. Filling-thread insertion gripper for a rapier weaving machine. 4,587,998, Cl. 139-448.000.

Egly, Robert A. Magnetic media and program case. 4,588,321, Cl. 402-77.000.

EGO Entwicklungsgesellschaft fur Optronik mbH: *See—*
Menke, Josef F.; and Zeifang, Gunter, 4,588,254, Cl. 350-6.700.

Egorochkin, Alexei N.: *See—*
Molodnyakov, Sergei P.; Fedorov, Jury I.; Kuznetsov, Vitaly A.; Egorochkin, Alexei N.; Birjukova, Tamara G.; and Razuvaev, Grigory A., 4,588,671, Cl. 430-191.000.

Egorova, Eleonora V.: *See—*
Fedorov, Svyatoslav N.; Egorova, Eleonora V.; Spiridonov, Oleg P.; Nanushian, Sergei R.; Benenson, Igor L.; Degtev, Evgeny I.; Masterov, Vyacheslav N.; and Kiselev, Vladimir G., 4,588,406, Cl. 623-6.000.

EGYT Gyogyszervegyeszeti Gyar: *See—*
Budai, Zoltan; Kis-Tamas, Attila; Lay nee Konya, Aranka; Vig, Zoltan; Andriska, Viktor; and Mezei, Tibor, 4,588,435, Cl. 71-103.000.

Ehrat, Arthur H. Material-spreading field vehicle having means for on-site metering and mixing of soil-treating chemicals. 4,588,127, Cl. 239-156.000.

Ehrentraut, Franz-Josef; and Henning, Manfred, to Robert Bosch GmbH; and Pierburg GmbH & Co. KG. High resolution control system for a pressure-responsive positioning device. 4,587,883, Cl. 91-363.00R.

Eibe, Werner W., to Blaw-Knox Corporation. Apparatus and method for press-edging hot slabs. 4,587,823, Cl. 72-206.000.

Eichinger, Daniel R.: *See—*
Evans, James W.; Scheid, John P.; and Eichinger, Daniel R., 4,588,391, Cl. 493-165.000.

Eisai Co., Ltd.: *See—*
Sawada, Takashi; Morimoto, Tomiaki; Miyoshi, Isao; Taguchi, Hirokuni; Tohmatsu, Junichi; and Kitamura, Toyohiro, 4,588,681, Cl. 435-5.000.

Eisenhart, Robert L., to Hughes Aircraft Company. Microwave power combiner with alternating diode modules. 4,588,963, Cl. 331-56.000.

Eisermann, Wolfgang: *See—*
Meyer, Karl-Heinrich; Heine, Diez; Alfes, Franz; and Eisermann, Wolfgang, 4,588,809, Cl. 528-500.000.

Eldering, Herman G.; and Kliman, Arthur W., to Baird Corporation. Radiation measuring system. 4,588,295, Cl. 356-300.000.

Elf France: *See—*
Raimond, Michel, 4,588,422, Cl. 55-67.000.

Eli Lilly and Company: *See—*
Justice, Richard M., Jr.; and Hall, David A., 4,588,484, Cl. 204-59.00R.

Elias, Ronald J., to Fleer Corporation. Chewing gum product and composition and process for the preparation thereof. 4,588,592, Cl. 426-5.000.

Elliot, Douglas G.: *See—*
Yao, Jame; Chen, Jong J.; and Elliot, Douglas G., 4,588,427, Cl. 62-17.000.

Ellis, Janet S.: *See—*
Stark, Robert G., Sr.; Stark, Robert G., Jr.; Ellis, Janet S.; and Stark, Tom, 4,588,106, Cl. 220-414.000.

Ellis, Peter E.: *See—*
Brown, James; Ellis, Peter E.; and Draper, Marta J., 4,588,602, Cl. 426-576.000.

Ellis, Theodore R.: *See—*
Massa, Ronald J.; Ellis, Theodore R.; and LePage, Robert G., 4,589,081, Cl. 364-554.000.

Ellisor, Alvin L.: *See—*
Links, Gordon R.; and Ellisor, Alvin L., 4,587,994, Cl. 138-89.000.

Elrod, Granville P.: *See—*
Story, Ray A.; and Elrod, Granville P., 4,588,096, Cl. 211-126.000.

Elscint, Ltd.: *See—*
Inbar, Dan; Gafni, Giora; Grimberg, Ernest; and Koren, Jacob, 4,588,897, Cl. 250-363.00S.

Elter, Michael R., to Xerox Corporation. Fusing apparatus. 4,588,281, Cl. 355-3.0FU.

Embree, Milton L.; and Perry, Elizabeth E., to AT&T Bell Laboratories. Temperature compensated semiconductor integrated circuit. 4,588,940, Cl. 323-313.000.

Emhart Industries, Inc.: *See—*
Grah, Neil E.; and Bannon, Albert C., 4,588,973, Cl. 336-192.000.
Marcinek, John A., 4,588,620, Cl. 428-35.000.
Nebelung, Hermann H., 4,588,068, Cl. 198-403.000.

Emmett, Robert C., to Envirotech Corporation. Lime slaking system including a cyclone and classifier for separating calcium hydroxide and grit particles from a slurry thereof. 4,588,559, Cl. 422-162.000.

Emmons, Donald A., to Frequency and Time Systems, Inc. Adjustable crystal oscillator with acceleration compensation. 4,588,969, Cl. 331-158.000.

Emmons, William D.; and Warburton, Charles E., Jr., to Rohm and Haas Company. Reactive diluents for polyepoxides. 4,588,788, Cl. 525-531.000.

Emulsitone Company: *See—*
Genser, Milton, 4,588,455, Cl. 148-189.000.

Emura, Bunsuke, to Fuji Photo Film Co., Ltd. Overhead projector. 4,588,271, Cl. 353-66.000.

Endo, Keizo; Matsumura, Hiroshi; Shimamura, Norio; and Kawabe, Masaru, to Tokyo Tatsuno Co., Ltd. Data input/output system for gasoline stations. 4,589,069, Cl. 364-405.000.

Endoh, Hiroyuki: *See—*
Ikenoue, Yutaka; Endoh, Hiroyuki; and Hayasaka, Tadao, 4,588,441, Cl. 75-230.000.

Enei, Hitoshi: *See—*
Tsuchida, Takayasu; Kurahashi, Osamu; Kawashima, Hiroki; Nakamori, Shigeru; and Enei, Hitoshi, 4,588,687, Cl. 435-108.000.

Energy Conversion Devices, Inc.: *See—*
Jayadev, Tumkur S.; Van Nguyen, On; Reyes, Jaime M.; Davis, Helen; and Putty, Michael W., 4,588,520, Cl. 252-512.000.
Johnson, Robert R., 4,588,903, Cl. 307-240.000.

Energy Research Corporation: *See—*
Abens, Sandors G.; and Keil, William, 4,588,659, Cl. 429-20.000.

Energy Vent, Inc.: *See—*
Prikkel, John, III; and Booher, Dale R., 4,587,706, Cl. 29-513.000.

Eng, Kai Y.; and Haskell, Barin G., to AT&T Bell Laboratories. Signal processor (system) for reducing bandwidth and for multiplexing a plurality of signals onto a single communications link. 4,589,110, Cl. 370-118.000.

Eng, Melvin D.: *See—*
Cologna, Rudy L.; Eng, Melvin D.; and King, Edgar P., 4,588,626, Cl. 428-63.000.

Engelhard Corporation: *See—*
Kaufman, Arthur; and Werth, John, 4,588,661, Cl. 429-36.000.

Engelhardt, Fritz: *See—*
Keil, Karl-Heinz; Engelhardt, Fritz; Greiner, Ulrich; Sternberger, Klaus; and Pelster, Manfred, 4,588,413, Cl. 8-543.000.

Engler, Martin: *See—*
Bieringer, Heimo; Engler, Martin; and Holtrup, Wolfgang, 4,588,791, Cl. 526-78.000.

Engstrom, George L.: *See—*
Miller, Cardell E.; Tracy, Gene A.; Engstrom, George L.; and Thorson, John, 4,588,221, Cl. 292-348.000.

Entreprise d'Equipements et Hydrauliques (E.M.H): *See—*
Ghilardi, Jean-Pierre R. F.; Forget, Rene F.; and Tuson, Samuel, 4,588,328, Cl. 405-202.000.

Envirotech Corporation: *See—*
Combet, Michel, 4,588,037, Cl. 175-220.000.
Emmett, Robert C., 4,588,559, Cl. 422-162.000.

Epson Corporation: *See—*
Koto, Haruhiko; Okada, Junichi; Ishii, Hiroshi; and Sawada, Kenji, 4,589,000, Cl. 346-140.00R.

ERDA, Inc.: *See—*
Young, Ronald L.; Rock, Eugene F.; and Brandt, David E., 4,588,226, Cl. 297-349.000.

Erhardt, Harry G., to RCA Corporation. IR-CCD imager and method of making the same. 4,588,261, Cl. 350-167.000.

Erhardt, Harry G., to RCA Corporation. Alignment method. 4,588,899, Cl. 250-491.100.

Erhardt, Herbert. Saw blade for preparing wood and other materials. 4,587,876, Cl. 83-839.000.

Eriksson, Sune; and Bjorling, Gotthard, to SKF Steel Engineering, AB. Method of recovering metals from liquid slag. 4,588,436, Cl. 75-10.00R.

ERNO-Raumfahrttechnik GmbH: *See*—
Bock, Jurgen; Gloyer, Gerd; Richter, Horst; and Felkei, Roland, 4,588,150, Cl. 244-161.000.

Escaravage, Gerard, to Aciers et Outillage Peugeot. Latch in particular for a vehicle door. 4,588,217, Cl. 292-201.000.

ESCO Corporation: *See*—
Sjogren, Kaj; and Brosh, James, 4,587,751, Cl. 37-142.00R.

Eskelson, Cleamond D. Pellet process for the detection of formaldehyde and/or glutaraldehyde. 4,588,696, Cl. 436-130.000.

Esser, Franz; Koppe, Herbert; Abele, Wolfgang; and Stockhaus, Klaus, to Boehringer Ingelheim KG. Analgesic 1-acetonyl-2-(phenylimino)-imidazolidines and salts thereof. 4,588,736, Cl. 514-392.000.

Essex Group, Inc.: *See*—
Burke, Steven A.; and Pali, Christopher, 4,588,344, Cl. 414-225.000.
Lavallee, Francois A., 4,588,784, Cl. 525-419.000.

Estadella, Maria A. S. Collapsible protecting helmet. 4,587,676, Cl. 2-424.000.

Etat Francais: *See*—
Giovachini, Jean-Luc; Varnier, Jean-Paul; Dern, Jean-Claude; Le Guet, Pierre-Loic; and Pascal, Jean-Pierre, 4,587,841, Cl. 73-148.000.

Etcheparre, Bernard; and Etcheparre, Jean. Fabric cutting apparatus and method. 4,588,871, Cl. 219-121.0LG.

Etcheparre, Jean: *See*—
Etcheparre, Bernard; and Etcheparre, Jean, 4,588,871, Cl. 219-121.0LG.

Ethyl Corporation: *See*—
Berry, C. Bernard, Jr., 4,588,533, Cl. 260-402.000.
Marlett, Everett M., 4,588,843, Cl. 564-508.000.
Shepherd, Lawrence H., Jr.; DeWitt, William J.; and Kuehnhanss, Gerhard O., 4,588,534, Cl. 260-513.00R.
Zaweski, Edward F.; and Niebylski, Leonard M., 4,588,415, Cl. 44-57.000.
Zaweski, Edward F.; and Niebylski, Leonard M., 4,588,416, Cl. 44-57.000.
Zaweski, Edward F.; and Miebylski, Leonard M., 4,588,417, Cl. 44-57.000.

Eutectic Corporation: *See*—
Kushner, Burton A., 4,588,655, Cl. 428-633.000.

Evans, Brian; and Peel, Christopher J., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Brittanic Majesty's Government of the. Aluminium alloys. 4,588,553, Cl. 420-533.000.

Evans, Dale M., to Don Evans, Inc. Wall-mounted file tray. 4,588,094, Cl. 211-55.000.

Evans, James W.; Scheid, John P.; and Eichinger, Daniel R., to Cherry-Burrell Corporation. Transfer system for use in carton forming and filling machinery. 4,588,391, Cl. 493-165.000.

Evans, Robert: *See*—
Holley, Loraine K.; and Evans, Robert, 4,587,970, Cl. 128-419.0PG.

Evenden, Gerald I.: *See*—
Botbol, Joseph M.; and Evenden, Gerald I., 4,589,132, Cl. 381-51.000.

Everett, Seth L., Jr., to United States of America, Army. Optically controlled multi-color impact printer. 4,588,316, Cl. 400-248.000.

Ex-Cell-O Corporation: *See*—
Lisiecki, Robert E., 4,588,122, Cl. 229-17.00R.

Excello Specialty Company, The: *See*—
Isaksen, Robert A.; Frappier, David E.; and Jones, Wallace R., 4,588,627, Cl. 428-80.000.

Exxon Production Research Co.: *See*—
Ramsey, Mark S.; and Stolle, Joseph W., 4,588,243, Cl. 339-65.000.

Exxon Research and Engineering Co.: *See*—
Fiocco, Robert J., 4,588,563, Cl. 422-256.000.
Pan, Wie-Hin; and Stiefel, Edward I., 4,588,829, Cl. 556-38.000.
Vanderspurt, Thomas H.; and Richard, Michael A., 4,588,705, Cl. 502-177.000.

Eysn, Manfred; Ducai, Viktor; and Hohmann, Kurt, to Voest-Alpine Aktiengesellschaft. Arrangement to be used with a tiltable metallurgical vessel. 4,588,169, Cl. 266-165.000.

F. Korbel and Bros. Inc.: *See*—
Steinke, Dale F., 4,587,896, Cl. 100-117.000.

Facci, John S.: *See*—
Stolka, Milan; McGrane, Kathleen M.; and Facci, John S., 4,588,666, Cl. 430-59.000.

Faddis, Chris: *See*—
Usry, Joe; Atkins, Roger; and Faddis, Chris, 4,588,425, Cl. 55-227.000.

Fafnir Bearing - Division of The Torrington Company: *See*—
Dickinson, Thorn W.; and Geiger, Gilbert W., deceased, 4,588,312, Cl. 384-482.000.

FAG Kugelfischer Georg Schafer KGaA: *See*—
Knappe, Bernhard; and Gerber, Erwin, 4,588,313, Cl. 384-604.000.

Fagrobel S.A.: *See*—
Foulart, Rene J., 4,588,126, Cl. 238-310.000.

Fahnrich, Hans-Jurgen; and Roll, Ulrich, to Patent Treuhand Gesellschaft fur elektrische Gluhlampen GmbH. Starting circuit for low-pressure discharge lamp, such as a compact fluorescent lamp. 4,588,925, Cl. 315-101.000.

Fanuc Ltd.: *See*—
Fujioka, Yoshiki; Ota, Naoto; and Hirota, Mitsuhiko, 4,588,937, Cl. 318-677.000.
Imazeki, Ryoji; and Kurakake, Mitsuo, 4,589,091, Cl. 364-900.000.
Kishi, Hajimu; and Seki, Masaki, 4,589,062, Cl. 364-168.000.

Farbaniec, Peter: *See*—
Guiler, Richard S.; and Farbaniec, Peter, 4,588,218, Cl. 292-307.00R.

Farmitalia Carlo Erba S.p.A.: *See*—
Cozzi, Paolo; Pillan, Antonio; and Lovisolo, Pier P., 4,588,738, Cl. 514-399.000.

Farnham, William B.: *See*—
Dicker, Ira B.; Farnham, William B.; Hertler, Walter R.; Laganis, Evan D.; Sogah, Dotsevi Y.; Del Pesco, Thomas W.; and Fitzgerald, Patrick H., 4,588,795, Cl. 526-192.000.

Faulkner, Richard D., to RCA Corporation. Electron discharge device having a thermionic electron control plate. 4,588,922, Cl. 313-553.000.

Faure, Jean-Louis, to ASA S.A. Process for piecing spun yarns. 4,587,802, Cl. 57-261.000.

Favre-Tissot, Jean-Paul, to Merlin Gerin. Method of producing an electrical contact member. 4,587,728, Cl. 29-879.000.

Fay, Thomas R.: *See*—
Groves, William A.; Harwood, Vance R.; Fay, Thomas R.; Bingham, Elton C.; and Teska, Michael A., 4,588,945, Cl. 324-158.00R.

Federico, Anthony M.; Kaisen, Kenneth R.; and Legg, Ernest L., to Xerox Corporation. Control system. 4,588,284, Cl. 355-14.00R.

Federico, Anthony M.: *See*—
Downing, Curtis B.; Wilczek, Stephen P.; Ziehm, Richard T.; Federico, Anthony M.; Husted, Raymond R.; and Edmunds, Michael E., 4,589,090, Cl. 364-900.000.

Federl, Alan R.; and Kipouras, George P., to Borg-Warner Chemicals, Inc. Antistatic thermoplastic composition. 4,588,773, Cl. 525-64.000.

Fedorov, Jury I.: *See*—
Molodnyakov, Sergei P.; Fedorov, Jury I.; Kuznetsov, Vitaly A.; Egorochkin, Alexei N.; Birjukova, Tamara G.; and Razuvaev, Grigory A., 4,588,671, Cl. 430-191.000.

Fedorov, Svyatoslav N.; Egorova, Eleonora V.; Spiridonov, Oleg P.; Nanushian, Sergei R.; Benenson, Igor L.; Degtev, Evgeny I.; Masterov, Vyacheslav N.; and Kiselev, Vladimir G. Intraocular lens. 4,588,406, Cl. 623-6.000.

Feil, Joseph N.; and Hrivnak, John E., to Goodyear Tire & Rubber Company, The. Wire coating process. 4,588,546, Cl. 264-510.000.

Felder, Ernst; and Zingales, Maria, deceased (by Sonia, Martinis Marchi Jellicich Maria, administrator), to Bracco Industria Chimica S.p.A. Process for the preparation of barium sulfate of increased flowability and density, suitable as a radio-opaque component in radiographic contrast agents, product obtained according to this process and the radiographic contrast agent produced therefrom. 4,588,574, Cl. 423-554.000.

Feldmann, Rainer: *See*—
Bax, Hanns-Jorg; Horlbeck, Gernot; Feldmann, Rainer; and Mumcu, Salih, 4,588,785, Cl. 525-419.000.

Felkei, Roland: *See*—
Bock, Jurgen; Gloyer, Gerd; Richter, Horst; and Felkei, Roland, 4,588,150, Cl. 244-161.000.

Fellinger, David F.: *See*—
Vlahos, Paul E.; Vlahos, Petro; and Fellinger, David F., 4,589,013, Cl. 358-22.000.

Fenn, Robert; and Stroud, Raymond R., to National Research Development Corp. Ultrasonic control of welding. 4,588,873, Cl. 219-124.340.

Ferag AG: *See*—
Muller, Erwin, 4,587,790, Cl. 53-118.000.

Ferbeck, Daniel; and Mimoun, Jamuel, to MATRA. Apparatus for detecting deflation of a guide wheel tire of a transportation vehicle. 4,588,977, Cl. 340-58.000.

Ferenc, Robert A.; and Lyons, Harold W., to Whelen Engineering Co., Inc. Mounting foot assembly. 4,588,118, Cl. 224-331.000.

Fernandez-Acebal, Jose ; Herm, Jurgen; Tomsen, Harald; and Wilms, Walter, to Blohm & Voss AG. Process and apparatus for obtaining inspection samples from wound coils. 4,588,119, Cl. 225-2.000.

Ferrero, Pietro, to Ferrero S.p.A. Package for food products, particularly sweet products. 4,588,078, Cl. 206-216.000.

Ferrero S.p.A.: *See*—
Ferrero, Pietro, 4,588,078, Cl. 206-216.000.

Ferris, Donald L.; and Marchitto, Michael J., to United Technologies Corporation. Flexible swashplate centering member. 4,588,355, Cl. 416-114.000.

Ferris, Michael J., to Beecham Group p.l.c. Arylethanolamine derivatives, their preparation and use in pharmaceutical compositions. 4,588,749, Cl. 514-649.000.

Ferris, Robert M., to Burroughs Wellcome Co. Treatment of drug induced psychosis. 4,588,728, Cl. 514-255.000.

Fetterolf, James R.; and Fisher, Jeffrey K., to AMP Incorporated. Stable impedance ribbon coax cable. 4,588,852, Cl. 174-36.000.

FICHT GmbH: *See*—
Peter, Klaus J., 4,589,079, Cl. 364-551.000.

Fidelity Medical, Inc.: *See*—
Palti, Yoram, 4,588,307, Cl. 374-170.000.

Field, Frank P. Merchandise display device. 4,588,093, Cl. 211-51.000.

Fielding, Herbert L.; and Ingwall, Richard T., to Polaroid Corporation. Photopolymerizable compositions used in holograms. 4,588,664, Cl. 430-1.000.

Fields, William G.: *See—*
Mientus, Bernard S.; Fields, William G.; and Bussey, Marlin G., 4,588,650, Cl. 428-516.000.

Fikentscher, Rolf: *See—*
Balzer, Wolf-Dieter; Bechtolsheimer, Hans-Heinrich; Beyer, Karl-Heinz; Fikentscher, Rolf; Perner, Johannes; Widder, Rudi; and Wolf, Helmut, 4,588,531, Cl. 260-402.000.

Finn, Charles A. Sound suppressor for a firearm. 4,588,043, Cl. 181-223.000.

Finnes, Steven J., to International Business Machines Corporation. Apparatus and method for composite image formation by scanning electron beam. 4,588,890, Cl. 250-307.000.

Finzel, Jack E., to Portable Power Tools, Inc. Portable power driven winch. 4,588,167, Cl. 254-346.000.

Fiocco, Robert J., to Exxon Research and Engineering Co. Cascade sieve tray for extraction and deasphalting. 4,588,563, Cl. 422-256.000.

Firmenich SA.: *See—*
Schulte-Elte, Karl-Heinrich, 4,588,849, Cl. 568-834.000.

Fischer, Hermann, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Rotary offset printing machine. 4,587,897, Cl. 101-137.000.

Fiscus, Walter J.; and Byrum, Ronnie L. Method for converting a lens. 4,588,619, Cl. 428-31.000.

Fisher, David J., to General Electric Company. Method and apparatus for analyzing gases dissolved in a liquid sample. 4,587,834, Cl. 73-23.100.

Fisher, Jeffrey K.: *See—*
Fetterolf, James R.; and Fisher, Jeffrey K., 4,588,852, Cl. 174-36.000.

Fisher, William E. Swivel connection for trailers. 4,588,199, Cl. 280-204.000.

Fisk, Thomas E.; and Hoffman, Dwight K., to Dow Chemical Company, The. Addition polymerizable adducts for nonaqueous dispersions. 4,588,830, Cl. 556-52.000.

Fitch, James C.: *See—*
Walley, David H.; and Fitch, James C., 4,588,505, Cl. 210-502.100.

Fitzgerald, Patrick H.: *See—*
Dicker, Ira B.; Farnham, William B.; Hertler, Walter R.; Laganis, Evan D.; Sogah, Dotsevi Y.; Del Pesco, Thomas W.; and Fitzgerald, Patrick H., 4,588,795, Cl. 526-192.000.

Flanagan, Raymond, to Si-Jet Limited. Cleaning of vessels for holding materials. 4,587,985, Cl. 134-169.00R.

Flanagan, Thomas P.: *See—*
Schoenberg, Jules E.; Flanagan, Thomas P.; and Ray-Chaudhuri, Dilip K., 4,588,767, Cl. 524-272.000.

Flax, Stephen W., to General Electric Company. Ultrasonic method and means for measuring blood flow and the like using autocorrelation. 4,587,973, Cl. 128-663.000.

Fleck, David A.: *See—*
Strong, David W.; McGinnis, Patricia A.; Peterson, James D.; Ballmer, Steven A.; Raburn, Vern L.; Hall, Dorothy L.; and Fleck, David A., 4,588,074, Cl. 206-45.150.

Fleer Corporation: *See—*
Elias, Ronald J., 4,588,592, Cl. 426-5.000.

Fletcher, Aaron N.: *See—*
McManis, George E., III; Fletcher, Aaron N.; and Bliss, Dan E., 4,588,662, Cl. 429-52.000.

Fletcher, Charles J., to Clawson Machine Company, Inc. Thermoelectric ice maker with plastic bag mold. 4,587,810, Cl. 62-3.000.

Flight Connector Corporation: *See—*
Schwartz, Lawrence; and Steele, Jerry T., 4,588,245, Cl. 339-89.00R.

Fling, Russell T.; and Naimpally, Saiprasad V., to RCA Corporation. Apparatus for symmetrically truncating two's complement binary signals as for use with interleaved quadrature signals. 4,589,084, Cl. 364-745.000.

Flintkote Company, The: *See—*
Pagen, Charles A.; Stepien, George, Jr.; and Morris, Paul A., 4,588,634, Cl. 428-283.000.

Florida Agricultural and Mechanical University: *See—*
Lee, Henry J., 4,588,530, Cl. 260-397.450.

Fluilogic Systems Oy: *See—*
Kaartinen, Niilo; and Johansson, Henrik, 4,588,554, Cl. 422-61.000.

Flynn, Daniel P.; and Ranford, Alan B., to Sherwood Medical Company. Tube clamping device. 4,588,160, Cl. 251-10.000.

FMC Corporation: *See—*
Bull, Randy A., 4,588,845, Cl. 568-771.000.
Provonchee, Richard B., 4,588,555, Cl. 422-72.000.
Raymond, Richard L.; Brown, Richard A.; Norris, Robert D.; and O'Neill, Eugene T., 4,588,506, Cl. 210-606.000.

Foidl, Leonhard. Installation for the treatment of combustion gases. 4,588,535, Cl. 261-22.000.

Fokos, Robert F.: *See—*
Cogswell, John; and Fokos, Robert F., 4,588,393, Cl. 493-440.000.

Ford Motor Company: *See—*
Kordomenos, Panagiotis I.; Kurple, Kenneth R.; and Alexander, Delores J., 4,588,787, Cl. 525-440.000.
Ruck, George E.; and Stefani, Michael H., 4,587,705, Cl. 29-450.000.

Forget, Rene F.: *See—*
Ghilardi, Jean-Pierre R. F.; Forget, Rene F.; and Tuson, Samuel, 4,588,328, Cl. 405-202.000.

Formosa Plastics Corporation: *See—*
Liau, Shung-Chung; Tseng, Kuo-Shu; and Huang, Yen H., 4,588,613, Cl. 427-230.000.

Forsyth, Paul F.: *See—*
Caul, Lawrence D.; and Forsyth, Paul F., 4,588,419, Cl. 51-295.000.

Fortune Systems Corporation: *See—*
Shah, Bakul V.; and Maskevitch, James A., 4,589,063, Cl. 364-200.000.

Foster, Charles H.: *See—*
Goodhue, Charles T.; Kydd, Gwendolyn C.; Foster, Charles H.; and McCombs, Charles A., 4,588,683, Cl. 435-59.000.

Foster, Robert M., to United States of America, Air Force. Multiple rate shock isolator damping valve. 4,588,053, Cl. 188-275.000.

Foster Wheeler Energy Corporation: *See—*
Berman, Irwin; and Sheehan, Joseph F., 4,587,904, Cl. 102-333.000.
Bonner, Stanley V.; and Baumann, Frederic F., 4,587,698, Cl. 29-33.00A.

Foulart, Rene J., to Fagrobel S.A. Metal element for fastening a rail to a concrete tie. 4,588,126, Cl. 238-310.000.

Fountain, Michael W.; Weiss, Steven J.; and Popescu, Mircea C., to Liposome Company, Inc., The. Lipid vesicles prepared in a monophase. 4,588,578, Cl. 424-1.100.

Fourrey, Francois; and Ciciliani, Patrice, to Cycles Peugeot. Device for locally adjusting the tension of an elastic sheet, in particular for a vehicle seat. 4,588,172, Cl. 267-89.000.

Fowler, Alan B.; and Hartstein, Allan M., to International Business Machines Corporation. Method of making short channel IGFET. 4,587,709, Cl. 29-571.000.

Fowler, James A. Filling of insulating material into building panels. 4,588,541, Cl. 264-45.200.

Franck, Jean-Pierre; and Bournonville, Jean-Paul, to Institut Francais du Petrole. Catalytic reforming process. 4,588,495, Cl. 208-65.000.

Franck, Jean-Pierre: *See—*
Blanchard, Gilbert; and Franck, Jean-Pierre, 4,588,497, Cl. 208-138.000.

Frank, Alan M.: *See—*
Lovoi, Paul A.; and Frank, Alan M., 4,588,885, Cl. 250-226.000.

Franke, Gunter: *See—*
Harms, Wolfgang; Franke, Gunter; and Wunderlich, Klaus, 4,588,810, Cl. 544-76.000.

Frappier, David E.: *See—*
Isaksen, Robert A.; Frappier, David E.; and Jones, Wallace R., 4,588,627, Cl. 428-80.000.

Fraser, Edward C.: *See—*
Rorden, Louis H.; and Fraser, Edward C., 4,587,741, Cl. 33-366.000.

Fraser, Thomas H.: *See—*
Herlihy, Walter C.; and Fraser, Thomas H., 4,588,686, Cl. 435-77.000.

Frederiksen, Jeffrey E., to Bally Manufacturing Corporation. Computer-peripheral interface for a game apparatus. 4,589,089, Cl. 364-900.000.

Frei, Siegfried; and Hohl, Ernst, to Siegfried Frei. Method of and arrangement for applying a strip-shaped powder layer on a weld seam of containers, and a container. 4,588,605, Cl. 427-28.000.

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Frentrup, Mark A.; Hirozawa, Stanley T.; Carson, James E.; and Coker, Daniel E., to BASF Wyandotte Corporation. Functional fluids and concentrates containing associative polyether thickeners and certain metal dialkyldithiophosphates. 4,588,511, Cl. 252-32.70E.

Frequency and Time Systems, Inc.: *See—*
Emmons, Donald A., 4,588,969, Cl. 331-158.000.

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Kado, Clarence I.; Rodriguez, Raymond L.; Froman, Byron E.; and Tait, Robert C., 4,588,689, Cl. 435-199.000.

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Walley, David H.; and Fitch, James C., 4,588,505, Cl. 210-502.100.

Frosch, Dieter: *See—*
Bachhuber, Karlheinz; and Frosch, Dieter, 4,588,579, Cl. 424-3.000.

Frost, Walter W.; and Hamilton, C. Ray, to Oxford Industries, Inc. Apparatus and method for forming belt loops and the like. 4,588,120, Cl. 227-76.000.

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Fuehrer, Calvin L.: *See—*
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Fuji Chemicals Industrial Co., Ltd.: *See—*
Asano, Takateru, 4,588,669, Cl. 430-156.000.

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Horinouchi, Shigeru; and Tanaka, Atsushi, 4,587,804, Cl. 60-230.000.

Fuji Kagakushi Kogyo Co., Ltd.: *See—*
Seto, Tadao; and Shimazaki, Yoshikazu, 4,588,315, Cl. 400-120.000.

Fuji Photo Film Co., Ltd.: *See—*
Emura, Bunsuke, 4,588,271, Cl. 353-66.000.
Furutachi, Nobuo, 4,588,679, Cl. 430-551.000.
Ikeda, Hideo, 4,588,678, Cl. 430-420.000.
Ishikawa, Takatoshi; and Nakajima, Junya, 4,588,677, Cl. 430-387.000.
Kataoka, Shinzi; Shinagawa, Yukio; and Sakaguchi, Shinji, 4,588,673, Cl. 430-264.000.
Kitamoto, Tatsuji; Shirahata, Ryuji; Yamada, Yasuyuki; and Akashi, Goro, 4,588,656, Cl. 428-694.000.
Nakamura, Masao, 4,588,298, Cl. 356-443.000.
Ochi, Shige, 4,589,028, Cl. 358-213.000.
Shirahata, Ryuji; Yanai, Akio; and Kitamoto, Tatsuji, 4,588,636, Cl. 428-336.000.

Fuji Xerox Co., Ltd.: *See*—
Nishimura, Nobuo; Itami, Teruhiko; Kimoto, Toshifumi; and Saitoh, Koichi, 4,588,995, Cl. 346-74.200.
Ozawa, Takashi; and Takenouchi, Mutsuo, 4,589,026, Cl. 358-213.000.
Fujii, Hiroyuki: *See*—
Tateno, Kenichi; Yokozawa, Masami; Fujii, Hiroyuki; Nishikawa, Mikio; Katoh, Michio; and Wada, Fujio, 4,589,010, Cl. 357-70.000.
Fujii, Norio: *See*—
Hada, Kazunari; Fujii, Norio; Azuma, Toru; Kikuchi, Kaoru; and Hazama, Junji, 4,589,139, Cl. 382-8.000.
Fujimori, Shoichi: *See*—
Miyagi, Tokuya; Inoue, Akihisa; Hamada, Katushi; Fujimori, Shoichi; and Hori, Yoshihiro, 4,588,464, Cl. 156-218.000.
Fujimori, Yasutomo: *See*—
Inazaki, Koji; Nangai, Takashi; Fujimori, Yasutomo; and Kimura, Hiroichi, 4,588,297, Cl. 356-376.000.
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Fujishige, Masao; Dokiya, Masayuki; Kameyama, Tetsuya; Yokokawa, Harumi; Ujiie, Seiichi; and Fukuda, Kenzo, to Agency of Industrial Science and Technology. Moulded object of alumina matter-containing raw material for aluminum smelting by blast furnace method. 4,588,438, Cl. 75-68.00A.
Fujita, Masaharu: *See*—
Kitago, Tohshichi; Fujita, Masaharu; and Kumagai, Seishiyo, 4,588,489, Cl. 204-180.900.
Fujitsu Limited: *See*—
Ayano, Mitsutoshi; Shibuya, Kiyoshi; Itou, Shin-ichi; Takatou, Kenji; and Tojo, Toshiro, 4,588,860, Cl. 179-77.000.
Chiba, Takashi; Koga, Satoru; and Senda, Minji, 4,589,064, Cl. 364-200.000.
Saito, Toshiyuki; Tokumitsu, Yasuyuki; Okubo, Naofumi; Daido, Yoshimasa; and Kurihara, Hiroshi, 4,588,962, Cl. 330-286.000.
Fukuchi, Masakazu; Kimura, Kiyoshi; Tarumi, Noriyoshi; Miwa, Tadashi; Okamoto, Yukio; and Ito, Kunio, to Konishiroku Photo Industry Co., Ltd. Cleaning roller intermediate transfer member. 4,588,279, Cl. 355-3.0TR.
Fukuda, Kazumasa: *See*—
Kobuke, Takayoshi; Izumi, Toshiaki; Saito, Seitoku; and Fukuda, Kazumasa, 4,588,654, Cl. 428-626.000.
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Fukuda, Michio: *See*—
Ogawa, Yukihiko; Kusumi, Saburo; Fukuda, Michio; Okunishi, Toshifumi; Miwa, Sinkichi; and Ohta, Yosinobu, 4,587,725, Cl. 29-753.000.
Fukuda, Tatemi: *See*—
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Fukuoka, Yohei: *See*—
Mitsui, Osamu; and Fukuoka, Yohei, 4,588,846, Cl. 568-835.000.
Fukuzawa, Kakumasa: *See*—
Sakai, Kenji; Wakabayashi, Takeshi; Fukuzawa, Kakumasa; and Hiraoka, Teruzo, 4,587,838, Cl. 73-116.000.
Fulgurit GmbH & Co. Kommanditgesellschaft: *See*—
Reinlein, Karl-Heinz; and Stablein, Bruno, 4,587,924, Cl. 118-70.000.
Fulmer, Richard D.: *See*—
Clayson, Arthur E.; Bates, Jack; and Fulmer, Richard D., 4,587,881, Cl. 89-37.160.
Furst, Howard: *See*—
Chung, Tai-Shung; Furst, Howard; Gurion, Zev; McMahon, Paul E.; Orwoll, Richard D.; and Palangio, Daniel, 4,588,538, Cl. 264-29.200.
Furuhashi, Hiroyuki: *See*—
Imai, Masafumi; Yamamoto, Tadashi; Furuhashi, Hiroyuki; Ueno, Hiroshi; and Inaba, Naomi, 4,588,793, Cl. 526-124.000.
Furutachi, Nobuo, to Fuji Photo Film Co., Ltd. Color photographic silver halide light-sensitive material. 4,588,679, Cl. 430-551.000.
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Sumita, Osao; Saito, Masayuki; Itou, Hisao; Kobayashi, Masahito; and Furutani, Yasumasa, 4,588,488, Cl. 204-145.00R.
Futaki, Kenji: *See*—
Yamanishi, Eiichi; Oono, Kenichi; Gokita, Masami; Futaki, Kenji; and Watanabe, Junji, 4,589,035, Cl. 358-296.000.
G. P. Plastics, Inc.: *See*—
Pierce, Owen A., 4,588,542, Cl. 264-45.500.
Gabler, William A.; and Julian, Frank M., to Du Pont de Nemours, E. I., and Company. Recycle of reclaimed water in partial oxidation process. 4,588,418, Cl. 48-197.00R.
Gafni, Giora: *See*—
Inbar, Dan; Gafni, Giora; Grimberg, Ernest; and Koren, Jacob, 4,588,897, Cl. 250-363.00S.
Gaiser, Robert F., to Allied Corporation. Brake system. 4,588,205, Cl. 280-725.000.
Galambos, Geza: *See*—
Gyory, Peter; Galambos, Geza; Kanay, Karoly; Ivanics, Jozsef; Dorman, Gyorgy; Kovacs, Gabor; Stadler, Istvan; Virag, Sandor; Tomoskozi, Istvan; Kormoczky, Peter; and Kovacs, Marianna, 4,588,713, Cl. 514-63.000.
Galand, Claude, to International Business Machines Corp. Multirate digital transmission method and device for implementing said method. 4,589,130, Cl. 381-31.000.
Gale, Robert M.; Goetz, Victor; Lee, Eun S.; Taskovich, Lina T.; and Yum, Su I., to Alza Corporation. Transdermal administration of fentanyl and device therefor. 4,588,580, Cl. 424-21.000.
Galiasso, Roberto: *See*—
Morales, Alfredo L.; Galiasso, Roberto; Carrasquel, Angel R.; and Salazar, Jose A., 4,588,709, Cl. 502-314.000.
Gallagher, Gregory, Jr., to SmithKline Beckman Corporation. Pharmaceutical methods using 4-aminoalkyl-2(3H)-indolones. 4,588,740, Cl. 514-418.000.
Gallo, Paul E.: *See*—
Antonini, Joseph; and Gallo, Paul E., 4,588,195, Cl. 277-153.000.
Gann Mess-u. Regeltechnik GmbH: *See*—
Hirth, Friedrich, 4,588,943, Cl. 324-61.00P.
Garcia, Fidel. Lock assembly. 4,587,816, Cl. 70-417.000.
Gardiner, Reginald. Zip-on zip-off dust ruffle. 4,587,683, Cl. 5-493.000.
Gargioni, Domenico: *See*—
Pizzi, Giordano; and Gargioni, Domenico, 4,588,302, Cl. 366-349.000.
Garland, Lester L.: *See*—
Kohn, Thomas F.; Garland, Lester L.; and Nelson, Eugene D., 4,588,377, Cl. 432-50.000.
Garrett, Charles B., to Varian Associates, Inc. Workpiece lifting and holding apparatus. 4,588,343, Cl. 414-221.000.
Garrett Corporation, The: *See*—
Curbishley, George; and Hoppin, George S., III, 4,587,700, Cl. 29-156.80R.
Kraus, James H., 4,587,866, Cl. 74-691.000.
Garthoff, Bernward: *See*—
Ingendoh, Axel; Meyer, Horst; and Garthoff, Bernward, 4,588,723, Cl. 514-231.000.
Gartnell, Lars: *See*—
Knez, Jordan; and Gartnell, Lars, 4,588,108, Cl. 221-68.000.
Gasc, Jean-Claude: *See*—
Humbert, Daniel; Gasc, Jean-Claude; and Hunt, Peter F., 4,588,731, Cl. 514-293.000.
Gasic, Gabriel J., to Pennsylvania Hospital. Method of treatment to inhibit metastasis. 4,588,587, Cl. 424-95.000.
Gateway Industries, Inc.: *See*—
Doty, Gerald A., 4,588,207, Cl. 280-801.000.
Gaus, Harry; and Gross, Hagen. Protective mechanism in electrically operated devices. 4,589,047, Cl. 361-42.000.
Gebr. Eickhoff Maschinenfabrik und Eisengiesserei m.b.H.: *See*—
Schupphaus, Herbert, 4,588,230, Cl. 299-1.000.
Geiger, Dolores A., executrix: *See*—
Dickinson, Thorn W.; and Geiger, Gilbert W., deceased, 4,588,312, Cl. 384-482.000.
Geiger, Gilbert W., deceased: *See*—
Dickinson, Thorn W.; and Geiger, Gilbert W., deceased, 4,588,312, Cl. 384-482.000.
Gelenkwellenbau GmbH: *See*—
Heier, Dieter; and Gille, Wilfried, 4,588,311, Cl. 384-456.000.
General Aluminum Products, Inc.: *See*—
Austin, Barry G., 4,588,227, Cl. 297-440.000.
General Dynamics Corporation/Convair Div.: *See*—
Vasques, Anthony J.; and Crupi, Raymond F., 4,587,777, Cl. 52-108.000.
General Dynamics Pomona Division: *See*—
Inglis, Ronald T., 4,588,145, Cl. 244-3.240.
General Electric Company: *See*—
Aycock, David F.; and Kinson, Philip L., 4,588,806, Cl. 528-215.000.
Baliga, Bantval J., 4,587,712, Cl. 29-571.000.
Cutler, John H.; and Stallard, Loyal N., 4,589,050, Cl. 361-86.000.
Dougherty, John J., 4,589,052, Cl. 361-94.000.
Fisher, David J., 4,587,834, Cl. 73-23.100.
Flax, Stephen W., 4,587,973, Cl. 128-663.000.
Hoegler, Leonard E.; and Otto, Lee W., 4,588,923, Cl. 313-579.000.
Klein, Keith W.; and Arnold, David, 4,588,878, Cl. 200-153.00G.
Komanduri, Ranga; and Reed, William R., Jr., 4,588,332, Cl. 407-114.000.
Lam, Jack F.; and Schmid, Hermann, 4,589,066, Cl. 364-200.000.
Lee, Gim F., Jr., 4,588,764, Cl. 524-128.000.
Liu, Nan-I, 4,588,754, Cl. 521-92.000.
Matzner, Bruce; Horn, Victor M.; Curulla, Michael V.; and Price, John F., 4,587,704, Cl. 29-446.000.
Miller, William H., 4,587,722, Cl. 29-596.000.
Muller, Alexander, 4,587,721, Cl. 29-596.000.
Prince, John S.; Herz, Harold L.; and Coleman, Edward P., Jr., 4,589,022, Cl. 358-168.000.
Santurtun, Carlos M.; Ceca, Felix L.; and Benegoechea, Jose M. Q., 4,589,051, Cl. 361-88.000.
Smearing, Robert W., 4,588,779, Cl. 525-180.000.
Williams, Robert E., Jr., 4,588,805, Cl. 528-172.000.
General Motors Corporation: *See*—
Brissette, Lawrence P., 4,587,760, Cl. 49-252.000.
Gold, Lowell C., 4,588,911, Cl. 310-62.000.
Gold, Lowell C.; and Hanshew, Mark H., 4,588,915, Cl. 310-194.000.
Gold, Thomas P.; and Muzechuk, Richard A., 4,588,173, Cl. 267-140.100.
Krage, Mark K., 4,588,953, Cl. 324-58.50C.

Lis, Robert J., 4,588,916, Cl. 310-260.000.
Miller, Larry D., 4,588,351, Cl. 415-47.000.
Newbould, John, 4,587,837, Cl. 73-56.000.
Rees, Richard W. A., 4,588,234, Cl. 308-3.800.
Sigler, David R., 4,588,449, Cl. 148-6.350.

Gengler, Jeffrey R., to Medical Engineering Corporation. Latch for securing an artificial sphincter. 4,587,955, Cl. 128-1.00R.

Genser, Milton, to Emulsitone Company. Planar diffusion source. 4,588,455, Cl. 148-189.000.

Georg Prinzing GmbH & Co. KG Betonformen- and Maschinenfabrik: *See*—
Kraiss, Richard, 4,588,544, Cl. 264-277.000.

George Blair PLC: *See*—
Reynard, Kenneth, 4,588,652, Cl. 428-594.000.

Georgiev, Vassil S.: *See*—
Saeva, Grace A.; and Georgiev, Vassil S., 4,588,812, Cl. 544-250.000.

Gerber, Erwin: *See*—
Knappe, Bernhard; and Gerber, Erwin, 4,588,313, Cl. 384-604.000.

Gerber, Heinz J., to Gerber Scientific, Inc. Apparatus with belt valve vacuum system for working on work material. 4,587,873, Cl. 83-100.000.

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Gerber, Heinz J., 4,587,873, Cl. 83-100.000.

Gerlach, Charles R.: *See*—
Heath, Rodney T.; and Gerlach, Charles R., 4,588,424, Cl. 55-208.000.

Gewerkschaft Eisenhutte Westfalia: *See*—
Kleibohmer, Friedrich, 4,588,071, Cl. 198-516.000.

Ghaderi, Sahba; Shohet, Juda L.; and Littlejohn, Duane P., to Nicolet Instrument Corporation. Mass spectrometer having magnetic trapping. 4,588,888, Cl. 250-291.000.

Ghilardi, Jean-Pierre R. F.; Forget, Rene F.; and Tuson, Samuel, to Entreprise d'Equipements et Hydrauliques (E.M.H). Movable joint device for coupling a column, tower or platform. 4,588,328, Cl. 405-202.000.

Giacalone, Joseph J. External catheter for incontinent males. 4,588,397, Cl. 604-349.000.

Gianfranco, Gibellino, to Officine Meccaniche G. Cerutti S.p.A. Plate holding roller particularly for flexographic printing applications. 4,587,901, Cl. 101-415.100.

Gibson, Robert L.: *See*—
Boston, Edward P.; and Gibson, Robert L., 4,588,153, Cl. 248-74.200.

Giebmanns, Karl, to Buderus Aktiengesellshaft. Apparatus for grinding. 4,587,767, Cl. 51-101.00R.

Gil, Eugenio S. Nonrotating, flexible key lock. 4,587,815, Cl. 70-352.000.

Gilbert, Sheri A.: *See*—
Sheth, Bhogilal B.; Gilbert, Sheri A.; and Kinsel, Jane F., 4,588,589, Cl. 424-195.100.

Gilchrist, Robert T., Jr., to Shell Oil Company. Propulsion method and apparatus for advancing a marine pipeline excavation shield. 4,588,329, Cl. 405-283.000.

Gille, Wilfried: *See*—
Heier, Dieter; and Gille, Wilfried, 4,588,311, Cl. 384-456.000.

Gillette Company, The: *See*—
Jacobson, Chester F., 4,587,729, Cl. 30-41.000.

Gillingham, Gary R.; and Rothman, James C., to Donaldson Company, Inc. Electrostatic separator. 4,588,423, Cl. 55-117.000.

Gillis, Rolando. Support assembly for a blood vessel or like organ. 4,587,969, Cl. 128-334.00R.

Gilwee, William J., Jr.: *See*—
Nir, Zohar; and Gilwee, William J., Jr., 4,588,778, Cl. 525-115.000.

Ginn, Martin E. Staged detergent/fabric treating preparation for use in washing machines. 4,588,080, Cl. 206-219.000.

Giovachini, Jean-Luc; Varnier, Jean-Paul; Dern, Jean-Claude; Le Guet, Pierre-Loic; and Pascal, Jean-Pierre, to Etat Francais. Hydrodynamic test apparatus. 4,587,841, Cl. 73-148.000.

Gisbourne, Bryan J.; and Myerscough, Paul F., to Scapa-Porritt Limited. Industrial fabrics. 4,588,632, Cl. 428-212.000.

Glassman, Alexander H., to Research Foundation for Mental Hygiene, Inc. Method of preventing withdrawal symptoms associated with the cessation or reduction of tobacco smoking. 4,588,739, Cl. 514-401.000.

Glatt, Werner. Rotation granulator. 4,588,366, Cl. 425-222.000.

Glogolja, Miroslav, to AT&T Bell Laboratories. High efficiency bias circuit for high frequency inductively loaded power switching transistor. 4,588,904, Cl. 307-255.000.

Gloyer, Gerd: *See*—
Bock, Jurgen; Gloyer, Gerd; Richter, Horst; and Felkei, Roland, 4,588,150, Cl. 244-161.000.

Gneuss, Detlef: *See*—
Zibell, Bodo; Patrovsky, Hubert; and Gneuss, Detlef, 4,588,502, Cl. 210-171.000.

Godejahn, Gordon C., Jr., to Rockwell International Corporation. Process for high density VLSI circuits, having self-aligned gates and contacts for FET devices and conducting lines. 4,587,711, Cl. 29-571.000.

Goebel, Eickhart. Tire-demounting device. 4,588,011, Cl. 157-1.170.

Goellner, Hermann. Slalom pole. 4,588,324, Cl. 404-10.000.

Goetz, Victor: *See*—
Gale, Robert M.; Goetz, Victor; Lee, Eun S.; Taskovich, Lina T.; and Yum, Su I., 4,588,580, Cl. 424-21.000.

Goff, Willie, Jr., to International Business Machines Corporation. System for generating circuit boards using electroeroded sheet layers. 4,587,727, Cl. 29-830.000.

Gokita, Masami: *See*—
Yamanishi, Eiichi; Oono, Kenichi; Gokita, Masami; Futaki, Kenji; and Watanabe, Junji, 4,589,035, Cl. 358-296.000.

Gold, David, to United States of America, Navy. Lowered opening shock parachute canopy. 4,588,149, Cl. 244-145.000.

Gold, Lowell C., to General Motors Corporation. Alternating current generator rotor and fan. 4,588,911, Cl. 310-62.000.

Gold, Lowell C.; and Hanshew, Mark H., to General Motors Corporation. Alternating current generator rotor. 4,588,915, Cl. 310-194.000.

Gold, Thomas P.; and Muzechuk, Richard A., to General Motors Corporation. Hydraulic-elastomeric mount. 4,588,173, Cl. 267-140.100.

Goldman, Ralph F.: *See*—
Madnick, Herman; and Goldman, Ralph F., 4,587,672, Cl. 2-158.000.

Golecki, Ilan, to Rockwell International Corporation. Method of eliminating p-type electrical activity and increasing channel mobility of Si-implanted and recrystallized SOS films. 4,588,447, Cl. 148-1.500.

Goodhue, Charles T.; Kydd, Gwendolyn C.; Foster, Charles H.; and McCombs, Charles A., to Eastman Kodak Company. Method of preparing 11β, 17α, 20, 21-tetrahydroxy steroids and corresponding 11β, 17α, 21-trihydroxy-20-oxo steroids. 4,588,683, Cl. 435-59.000.

Goodman, Alvin M.: *See*—
Goodman, Lawrence A.; and Goodman, Alvin M., 4,587,713, Cl. 29-576.00B.

Goodman, Joseph W.: *See*—
Tur, Moshe; Goodman, Joseph W.; Shaw, Herbert J.; Moslehi, Behzad; and Bowers, John E., 4,588,255, Cl. 350-96.160.

Goodman, Lawrence A.; and Goodman, Alvin M., to RCA Corporation. Method for making vertical MOSFET with reduced bipolar effects. 4,587,713, Cl. 29-576.00B.

Goodwin, R. Wendell, to Sangamo Weston, Inc. Optical shaft encoder. 4,588,982, Cl. 340-347.00P.

Goodyear Tire & Rubber Company, The: *See*—
Feil, Joseph N.; and Hrivnak, John E., 4,588,546, Cl. 264-510.000.

Gotoh, Yuzoh: *See*—
Ohki, Junichi; Gotoh, Yuzoh; and Kamei, Takanao, 4,587,889, Cl. 92-98.00D.

Gougoulas, Harry K. Proximity detector system for automatic car washer/dryer equipment. 4,587,688, Cl. 15-316.00R.

Gould Inc.: *See*—
Tsao, Kuey-Yeou, 4,587,710, Cl. 29-571.000.

Grabowy, James G. Visual display network interface. 4,588,862, Cl. 179-81.00C.

Grah, Neil E.; and Bannon, Albert C., to Emhart Industries, Inc. Coil bobbin having novel means for terminating fine wires. 4,588,973, Cl. 336-192.000.

Granitz, Fritz: *See*—
Waltl, Josef; Granitz, Fritz; and Schwaha, Karl, 4,588,020, Cl. 164-454.000.

Grapha-Holding AG: *See*—
Abegglen, Heinz, 4,588,470, Cl. 156-578.000.

Graphic Controls Corporation: *See*—
Mruk, Norbert J.; Vaughan, Raymond C.; and Eddy, Arthur R., Jr., 4,588,762, Cl. 524-45.000.

Grappe, Rene ; and Martin, Pascal, to Souriau & C. Electric connectors intended particularly to be used in a liquid medium particularly under pressure. 4,588,247, Cl. 339-94.00M.

Grass Valley Group, Inc., The: *See*—
Taylor, Gerald G., 4,588,906, Cl. 307-270.000.

Gray, Raymond G., Sr.: *See*—
Love, Larry W.; Gray, Raymond G., Sr.; and Love, Jerry A., 4,587,678, Cl. 4-251.000.

Gray, Ronald A. Locking window assembly. 4,587,759, Cl. 49-50.000.

Greene, Edwin B. Machine readable document. 4,588,211, Cl. 283-70.000.

Greene, Ted J.; and Waidelich, Matthew V., to United States Manufacturing Company. Tibia/ankle orthosis. 4,587,962, Cl. 128-80.00H.

Greenway, Frank L., III; and Bray, George A. Treatment for selective reduction of regional fat deposits. 4,588,724, Cl. 514-250.000.

Gregorutti, Paolo: *See*—
Melzi, Carlo; and Gregorutti, Paolo, 4,588,010, Cl. 152-213.00A.

Greiner, Ulrich: *See*—
Keil, Karl-Heinz; Engelhardt, Fritz; Greiner, Ulrich; Sternberger, Klaus; and Pelster, Manfred, 4,588,413, Cl. 8-543.000.

Gretag Aktiengesellschaft: *See*—
Horvath, Stephan; and Wu, Yung-Shain, 4,589,131, Cl. 381-38.000.

Greulich, Bodo: *See*—
Schmitz, Gunther; Greulich, Bodo; and Kettenring, Gerhard, 4,588,105, Cl. 220-359.000.

Griffen, Charles W.: *See*—
Salyer, Ival O.; Griffen, Charles W.; and Duvall, Donovan S., 4,588,510, Cl. 252-5.000.

Griffin, Groves L. Key ring holder. 4,587,818, Cl. 70-457.000.

Griffin, William D.; and Griffin, William D., II. Reversible magnetic therapeutic device and method of use. 4,587,956, Cl. 128-1.300.

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Griffin, William D.; and Griffin, William D., II, 4,587,956, Cl. 128-1.300.

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Grim, Claude: *See—*
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Grimberg, Ernest: *See—*
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Gripper, Inc.: *See—*
Pennell, Raymond; and Reneau, Bobby J., 4,587,990, Cl. 137-454.200.

Grischkowsky, Daniel R.: *See—*
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Groet, Suzanne; Ostman, Jonathan; and Wydro, Robert, to Integrated Genetics, Inc. Binding nucleic acid to a support. 4,588,682, Cl. 435-6.000.

Grohe, Klaus: *See—*
Petersen, Uwe; Grohe, Klaus; Zeiler, Hans-Joachim; and Metzger, Karl G., 4,588,726, Cl. 514-254.000.

Gross, Donald W., to Chem-tronics, Incorporated. Chemical milling processes and etchants therefor. 4,588,474, Cl. 156-659.100.

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Gross, R. Michael, to Ball Corporation. Coextrusion inspection system. 4,587,849, Cl. 73-644.000.

Grossiord, Claude: *See—*
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Grossmann, Walter: *See—*
Link, Helmut F.; and Grossmann, Walter, 4,587,697, Cl. 29-27.00C.

Groves, William A.; Harwood, Vance R.; Fay, Thomas R.; Bingham, Elton C.; and Teska, Michael A., to Hewlett-Packard Company. High throughput circuit tester and test technique avoiding overdriving damage. 4,588,945, Cl. 324-158.00R.

Grumich, Joseph: *See—*
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Grundtner, Matthias J. Magnetic head having a thermoplastic or a thermosetting plastic housing. 4,589,043, Cl. 360-126.000.

Gruner, Sol M.; and Kirk, Gregory, to University Patents, Inc. Encapsulated scintillators for measuring the concentration of tritiated solutes. 4,586,698, Cl. 436-535.000.

Grunwald, Werner: *See—*
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GTE Communication Systems Corporation: *See—*
Bernardson, Peter S., 4,588,980, Cl. 340-347.0DA.

GTE Products Corporation: *See—*
Anderton, John J., 4,588,176, Cl. 269-16.000.
Mickelson, N. Peter; and Napiorkowski, John J., 4,588,238, Cl. 339-91.00R.

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Guerette, Normand. Device for fixing the wish-bone of the sail-board to the mast in a fast and rigid manner. 4,587,916, Cl. 114-39.000.

Guest, Timothy S., to John Guest Limited. Couplings for tubes and other fluid handling components. 4,588,214, Cl. 285-323.000.

Guiler, Richard S.; and Farbaniec, Peter, to E. J. Brooks Company. Security seal. 4,588,218, Cl. 292-307.00R.

Gulf Coast Aqua Leisure, Inc.: *See—*
Wolfe, Henry S., 4,588,618, Cl. 428-7.000.

Gurgiolo, Arthur E., to Dow Chemical Company, The. Oxyalkylene aromatic amines. 4,588,840, Cl. 564-443.000.

Gurion, Zev: *See—*
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Gustafson, Inc.: *See—*
Bartholomay, Donald O., 4,587,858, Cl. 73-863.530.

Gustafson, Manfred W., to Seco Tools AB. Chip cutting tool. 4,588,333, Cl. 407-117.000.

Gutierrez, Thomas. Card collator with bottom hole pneumatic puller extractor. 4,588,179, Cl. 270-58.000.

Gutter, David H.: *See—*
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Guy, Jimmy R., to American Precision Vibrator Co. Vibrator assembly. 4,588,300, Cl. 366-114.000.

Gyory, Peter; Galambos, Geza; Kanay, Karoly; Ivanics, Jozsef; Dorman, Gyorgy; Kovacs, Gabor; Stadler, Istvan; Virag, Sandor; Tomoskozi, Istvan; Kormoczky, Peter; and Kovacs, Marianna, to Chinoin Gyogyszer Vegyeszeti Termekek Gyara Rt. Selective biologically active 7-oxo-prostacyclin derivatives and pharmaceutical compositions containing same. 4,588,713, Cl. 514-63.000.

H. R. Electronics Company: *See—*
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Haag, William G.; and Chavdarian, Charles G., to Stauffer Chemical Company. S-dithiocarbamoylmethyl trithiophosphonate insecticides, compositions and use. 4,588,714, Cl. 514-114.000.

Haas, Max, to Inventio AG. Double panel sliding door, especially for elevators. 4,588,049, Cl. 187-56.000.

Haber, Terry M., to Habley Medical Technology Corporation. Elastomeric prosthetic sphincter. 4,587,954, Cl. 128-1.00R.

Habib, Ikram W. Traveling fluidized bed distillation of scrap tires and rubber vulcanizate. 4,588,477, Cl. 201-25.000.

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Hachimura, Kenji: *See—*
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Hacke, Joseph F.: *See—*
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Hackwood, Susan: *See—*
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Hada, Kazunari; Fujii, Norio; Azuma, Toru; Kikuchi, Kaoru; and Hazama, Junji, to Nippon Kogaku K. K. Apparatus for detecting defects in pattern. 4,589,139, Cl. 382-8.000.

Hagelstein, Peter L., to United States of America, Energy. Short wavelength laser. 4,589,113, Cl. 372-5.000.

Hagemann, Fritz; Block, Hans-Jurgen; Hancke, Gustav; and Muss, Manfred, to Hauni-Werke Korber & Co. KG. Apparatus for supplying particulate material to tobacco processing machines and the like. 4,587,979, Cl. 131-110.000.

Haglund, Allen, to Camper Delight Sales Corp. Portable gas-fired cooking device. 4,587,948, Cl. 126-38.000.

Hahn, Robert S. Grinding machine. 4,587,763, Cl. 51-5.00D.

Hakata, Tetsuro: *See—*
Harumoto, Yoshinobu; Yoshida, Yoshio; Kabayama, Yuichi; Kan, Hisao; Hakata, Tetsuro; and Matsumoto, Takahiro, 4,588,972, Cl. 336-58.000.

Haken, Roger A.; Alperin, Michael E.; and Lau, Chi K., to Texas Instruments Incorporated. Process for forming $TiSi_2$ layers of differing thicknesses in a single integrated circuit. 4,587,718, Cl. 29-571.000.

Halbach & Braun: *See—*
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Hall, David A.: *See—*
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Hall, Dorothy L.: *See—*
Strong, David W.; McGinnis, Patricia A.; Peterson, James D.; Ballmer, Steven A.; Raburn, Vern L.; Hall, Dorothy L.; and Fleck, David A., 4,588,074, Cl. 206-45.150.

Hall, James E.: *See—*
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Hall, James T.: *See—*
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Hall, Steven E.: *See—*
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Haller, Eugene E.: *See—*
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Hallerback, Stig L., to Aktiebolaget SKF. Mounting tool. 4,587,715, Cl. 29-525.000.

Halliburton Company: *See—*
Weigand, Willis A.; and Totten, Patty L., 4,588,032, Cl. 166-291.000.

Haloila, Matti, to Oy M. Haloila AB. Packaging machine. 4,587,796, Cl. 53-588.000.

Hamada, Katushi: *See—*
Miyagi, Tokuya; Inoue, Akihisa; Hamada, Katushi; Fujimori, Shoichi; and Hori, Yoshihiro, 4,588,464, Cl. 156-218.000.

Hamaguchi, Shigeki; Yamamura, Hiroshi; Hasegawa, Junzo; Kawaharada, Hajime; and Watanabe, Kiyoshi, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Process for production of optically active oxazolidinone derivative. 4,588,694, Cl. 435-280.000.

Hamer, Gerald D. Method and apparatus for reconditioning band saw blade. 4,587,869, Cl. 76-58.000.

Hamer, R. Richard L.: *See—*
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Hamilton, C. Ray: *See—*
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Hancke, Gustav: *See—*
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Handtmann, Dieter, to Robert Bosch GmbH. Arrangement for measuring the mass flow-rate of a flowing medium. 4,587,842, Cl. 73-204.000.

Haney, T. L., to Kansas City Southern Railway Company, Inc., The. Railroad tie transport car. 4,587,907, Cl. 105-378.000.

Hansen, William L.; and Haller, Eugene E., to United States of America, Energy. Germanium detector passivated with hydrogenated amorphous germanium. 4,589,006, Cl. 357-29.000.

Hanshew, Mark H.: *See*—
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Auslander, Marc A.; Cocke, John; Hao, Hsieh T.; Markstein, Peter W.; and Radin, George, 4,589,087, Cl. 364-768.000.
Horn, Robert E.; Jacobs, Harold, deceased; and Hao, Hsieh T., 4,588,966, Cl. 331-96.000.
Hapgood, William H., to Raytheon Company. Coiled heat exchanger. 4,588,026, Cl. 165-158.000.
Haque, Reza; and Smith, Edward F., III, to Olin Corporation. Three-step plasma treatment of copper foils to enhance their laminate adhesion. 4,588,641, Cl. 428-413.000.
Harms, Wolfgang; Franke, Gunter; and Wunderlich, Klaus, to Bayer Aktiengesellschaft. Basic triphendioxazine dyestuffs. 4,588,810, Cl. 544-76.000.
Harper, Douglas M. House signaling device. 4,587,753, Cl. 40-451.000.
Harrah, Larry A.; and Zeigler, John M., to United States of America, Energy. Polysilane positive photoresist materials and methods for their use. 4,588,801, Cl. 528-33.000.
Harris Corporation: *See*—
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Herzog, William E.; and Atkins, John H., 4,588,959, Cl. 330-149.000.
Harrison, Leonard, to Center Engineering, Inc. Hold-down device. 4,588,178, Cl. 269-234.000.
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Hartness International, Inc.: *See*—
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Harwood, Vance R.: *See*—
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Haskell, Barin G.; and Schmidt, Robert L., to AT&T Bell Laboratories. Technique for the time frequency multiplexing on three television signals. 4,589,018, Cl. 358-142.000.
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Hatashita, Hiroshi: *See*—
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Hausen, Marek, to Brown, Boveri & Cie Aktiengesellschaft. Method and circuit for flatness control in rolling mills. 4,587,819, Cl. 72-9.000.
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Heiker, Fred R.; Muller, Lutz; Puls, Walter; and Bischoff, Hilmar, to Bayer Aktiengesellschaft. Medicaments containing amino-cyclitol derivatives. 4,588,710, Cl. 514-25.000.
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Heitner, Barry J., to Du Pont de Nemours, E. I., and Company. Process for preparing acrylic polymer sheets using a dual peroxide initiator system. 4,588,798, Cl. 526-228.000.
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Henley, Francois J., to Data Probe Corporation. Test system for VLSI digital circuit and method of testing. 4,588,950, Cl. 324-158.00R.
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Herzog, William E.; and Atkins, John H., to Harris Corporation. Hum neutralization circuit. 4,588,959, Cl. 330-149.000.

Hesser, Paul, to Robert Bosch GmbH. Non-contacting code recognition system for code carriers on production line workpieces. 4,588,880, Cl. 235-376.000.
Hestad, Alfred M., to Vodavi Technology Corporation. Music on hold for key systems. 4,588,865, Cl. 179-99.00H.
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Hill, George W., Jr. Belt-attached seat. 4,588,224, Cl. 297-4.000.
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Yamamuro, Sigeaki; Abo, Keiju; Tanaka, Yoshikazu; Kumura, Haruyoshi; Hirano, Hiroyuki; and Morimoto, Yoshiro, 4,589,071, Cl. 364-424.100.
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Hirozawa, Stanley T.: *See*—
Frentrup, Mark A.; Hirozawa, Stanley T.; Carson, James E.; and Coker, Daniel E., 4,588,511, Cl. 252-32.70E.
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Iwamoto, Taro, 4,588,350, Cl. 414-787.000.
Kaneko, Kenji; Okabe, Takahiro; and Nagata, Minoru, 4,589,096, Cl. 365-154.000.
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Saito, Syobu, 4,588,891, Cl. 250-310.000.
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Matsui, Satoshi, 4,587,765, Cl. 51-56.00R.
Hitco: *See*—
Petersen, Robert B., 4,588,799, Cl. 528-9.000.
Hoda, Takeo; Taniguchi, Nobuyuki; and Seigenji, Kiyoshi, to Minolta Camera Kabushiki Kaisha. Film cartridges, films and cameras adapted for use therewith. 4,588,272, Cl. 354-21.000.
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Spietschka, Ernst; and Urban, Manfred, 4,588,814, Cl. 546-37.000.
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Effland, Richard C.; Klein, Joseph T.; and Hamer, R. Richard L., 4,588,727, Cl. 514-255.000.
Hoegler, Leonard E.; and Otto, Lee W., to General Electric Company. High efficiency tubular heat lamps. 4,588,923, Cl. 313-579.000.
Hoffman, Dwight K.: *See*—
Fisk, Thomas E.; and Hoffman, Dwight K., 4,588,830, Cl. 556-52.000.
Hoffman, Kenneth F., to Hale Fire Pump Company. Transmission for pumps. 4,587,862, Cl. 74-15.880.
Hoffmann-La Roche Inc.: *See*—
Boris, Alfred, 4,588,750, Cl. 514-765.000.
Hohl, Ernst: *See*—
Frei, Siegfried; and Hohl, Ernst, 4,588,605, Cl. 427-28.000.
Hohl, Frank: *See*—
Bohmer, Branislav; Lange, Werner; and Hohl, Frank, 4,588,772, Cl. 525-54.230.
Hohman, Charles M.; Propster, Mark A.; and Seng, Stephen, to Owens-Corning Fiberglas Corporation. Method of heating particulate material with a particulate heating media. 4,588,429, Cl. 65-27.000.
Hohmann, Kurt: *See*—
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Hohmann, Volker: *See*—
Pietsch, Hanns; Hohmann, Volker; and Kluck, Detlef, 4,588,583, Cl. 424-81.000.
Holbert, Gene W.: *See*—
Burkhart, Joseph P.; and Holbert, Gene W., 4,588,825, Cl. 549-475.000.
Holcomb, David J.; and McNamee, Michael J., to United States of America, Energy. Gage for measuring displacements in rock samples. 4,587,739, Cl. 33-143.00L.
Holland, Keith T.: *See*—
Cunliffe, William J.; Eady, Elizabeth A.; and Holland, Keith T., 4,588,692, Cl. 435-253.000.
Holley, John M., Jr., to Mead Corporation, The. Enclosed bottle carrier for returnable bottles. 4,588,084, Cl. 206-427.000.
Holley, Loraine K.; and Evans, Robert, to Telectronics N.V. Tachycardia reversion pacer. 4,587,970, Cl. 128-419.0PG.
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van der Neer, Abram P.; and Holman, Harm W., 4,588,046, Cl. 182-236.000.
Holmgren, Werner A. Method and apparatus for the manufacture of welding electrodes. 4,587,726, Cl. 29-825.000.

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Burnham, Robert; Holonyak, Nick, Jr.; and Chung, Harlan F., 4,589,115, Cl. 372-20.000.

Holtrup, Wolfgang: *See*—
Bieringer, Heimo; Engler, Martin; and Holtrup, Wolfgang, 4,588,791, Cl. 526-78.000.

Holzschuh, Johann, to Battenfeld Maschinenfabriken GmbH. Injection molding assembly. 4,588,365, Cl. 425-183.000.

Home Health Care of America, Inc.: *See*—
Brennan, Eric L.; and Schawel, Kenneth W., 4,587,793, Cl. 53-425.000.

Homma, Shinobu, to Kabushiki Kaisha Honma. Food shaving apparatus. 4,588,136, Cl. 241-95.000.

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Matsumoto, Kou; Oota, Toshio; Asaka, Yugi; and Nakamura, Mitsuki, 4,587,828, Cl. 72-356.000.
Matsuura, Masaaki; and Nakano, Yoshikatsu, 4,587,936, Cl. 123-315.000.
Miyatake, Satoshi; Abe, Mitsuo; and Kume, Masao, 4,587,766, Cl. 51-95.0GH.

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Radtke, Ernst-Rudolf, 4,589,038, Cl. 360-79.000.

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Mendala, John M., 4,589,120, Cl. 375-117.000.
Place, William C., 4,589,088, Cl. 364-900.000.
Torborg, Ralph H., 4,588,372, Cl. 431-78.000.

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Honma, Kazuo: *See*—
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Hoopman, Timothy L., to Minnesota Mining and Manufacturing Company. Cube-corner retroreflective articles having wide angularity in multiple viewing planes. 4,588,258, Cl. 350-103.000.

Hoorman, Ronald A.: *See*—
Levasseur, Joseph L.; and Hoorman, Ronald A., 4,587,984, Cl. 133-8.00R.

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Poldy, Carlo; and Hopfmuller, Gebhard, 4,589,136, Cl. 381-94.000.

Hopkins, E. Leon: *See*—
Hartness, Thomas S.; and Hopkins, E. Leon, 4,587,792, Cl. 53-382.000.

Hopkins, William D.: *See*—
Laffitte, David S.; Hopkins, William D.; and Hayn, John W., II, 4,589,099, Cl. 365-230.000.

Hoppin, George S., III: *See*—
Curbishley, George; and Hoppin, George S., III, 4,587,700, Cl. 29-156.80R.

Hori, Roy Y.: *See*—
Walker, Charles B.; Hori, Roy Y.; and Butler, Michael B., 4,587,964, Cl. 128-92.00E.

Hori, Yoshihiro: *See*—
Miyagi, Tokuya; Inoue, Akihisa; Hamada, Katushi; Fujimori, Shoichi; and Hori, Yoshihiro, 4,588,464, Cl. 156-218.000.

Horig, Jurgen, to Veb Kombinat Nagema. Control device for dosing emulsifiers in chocolate mass. 4,587,894, Cl. 99-487.000.

Horigome, Hirofumi, to Ricoh Company, Ltd. Lens driving device of an auto-focus system. 4,588,278, Cl. 354-406.000.

Horinouchi, Shigeru; and Tanaka, Atsushi, to Fuji Jukogyo Kabushiki Kaisha. Device for increasing and deflecting thrust of jet-propulsion engine of V/STOL aircraft. 4,587,804, Cl. 60-230.000.

Horlbeck, Gernot: *See*—
Bax, Hanns-Jorg; Horlbeck, Gernot; Feldmann, Rainer; and Mumcu, Salih, 4,588,785, Cl. 525-419.000.

Horn, Robert E.; Jacobs, Harold, deceased (by Jacobs, Lydia S., executrix); and Hao, Hsieh T., to United States of America, Army. Image line voltage controlled oscillator with replaceable components. 4,588,966, Cl. 331-96.000.

Horn, Robert E.; and Jacobs, Harold, deceased (by Jacobs, Lydia S., executrix), to United States of America, Army. Integrated varactor tuned coaxial gun oscillator for 60 GHz operation. 4,588,967, Cl. 331-107.00G.

Horn, Victor M.: *See*—
Matzner, Bruce; Horn, Victor M.; Curulla, Michael V.; and Price, John F., 4,587,704, Cl. 29-446.000.

Hornak, Lawrence A.: *See*—
Beni, Gerardo; Hackwood, Susan; and Hornak, Lawrence A., 4,588,348, Cl. 414-730.000.

Horner, Joseph L., to United States of America, Air Force. Phase-only optical filter for use in an optical correlation system. 4,588,260, Cl. 350-162.130.

Horowitz, Seymour M.; Nesbitt, Dale D.; Horowitz, Seymour M.; and Nesbitt, Dale D. Method and apparatus for laying wire arrays. 4,588,462, Cl. 156-177.000.

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Horvath, Agnes: *See*—
Hermecz, Istvan; Vasvari nee Debreczy, Lelle; Horvath, Agnes; Kokosi, Jozsef; Virag, Sandor; and Breining, Tibor, 4,588,526, Cl. 260-243.300.

Horvath, Stephan; and Wu, Yung-Shain, to Gretag Aktiengesellschaft. Voiced/unvoiced decision using sequential decisions. 4,589,131, Cl. 381-38.000.

Hosel, Fritz, to Trutzschler GmbH & Co. KG. Method and apparatus for feeding fiber material to a plurality of fiber processing machines. 4,587,691, Cl. 19-80.00R.

Hosoda, Seiichi: *See*—
Kanno, Masahide; Amano, Atsushi; Hosoda, Seiichi; and Hattori, Shinichiro, 4,588,927, Cl. 315-307.000.

Hosono, Nagao; Nagase, Yukio; Takeuchi, Tatsuo; Egami, Hidemi; and Satomura, Hiroshi, to Canon Kabushiki Kaisha. Method and device for charging or discharging a member. 4,589,053, Cl. 361-213.000.

Hosoya, Jun: *See*—
Nakata, Kazuo; Hosoya, Jun; Ohshima, Shigeru; and Sekiguchi, Takeshi, 4,589,015, Cl. 358-55.000.

Hotma, Johan J.: *See*—
Raura, Pentti; and Hotma, Johan J., 4,588,007, Cl. 144-176.000.

Hotta, Masahiro, to Dainippon Plastics Co., Ltd. Synthetic resin composition. 4,588,777, Cl. 525-93.000.

Houminer, Yoram; Southwick, Everett W.; and Williams, David L., to Philip Morris Incorporated. 1-pyrazinyl-1-propanone derivatives useful as flavorants in smoking compositions. 4,588,813, Cl. 544-406.000.

Hovland, Jon: *See*—
Nissen, Bernt A.; and Hovland, Jon, 4,588,690, Cl. 435-200.000.

Howa Kogyo Kabushiki Kaisha: *See*—
Miyachi, Chihiro, 4,587,708, Cl. 29-568.000.

Howard, Atlas. Method and apparatus for securing wheelchairs. 4,588,340, Cl. 410-7.000.

Hoya Corporation: *See*—
Suzuki, Teiichi; and Izumitani, Tetsuro, 4,589,118, Cl. 372-71.000.

Hrivnak, John E.: *See*—
Feil, Joseph N.; and Hrivnak, John E., 4,588,546, Cl. 264-510.000.

Huang, Fu-chih, to USV Pharmaceutical Corp. Antiallergic bis-imidazolinoamino derivatives. 4,588,737, Cl. 514-392.000.

Huang, Yen H.: *See*—
Liau, Shung-Chung; Tseng, Kuo-Shu; and Huang, Yen H., 4,588,613, Cl. 427-230.000.

Huck Manufacturing Co.: *See*—
Sukharevsky, Boris P., 4,587,829, Cl. 72-391.000.

Hudson, Andrew: *See*—
Stewart, Malcolm J.; Hudson, Andrew; and Griffiths, Peter W., 4,588,674, Cl. 430-273.000.

Hudson Oxygen Therapy Sales Company: *See*—
Shanks, Thomas P., 4,588,129, Cl. 239-338.000.

Huebner, Fritz, to Plascore, Inc. Method of constructing heat exchanger core. 4,588,543, Cl. 264-248.000.

Huels Aktiengesellschaft: *See*—
Bieringer, Heimo; Engler, Martin; and Holtrup, Wolfgang, 4,588,791, Cl. 526-78.000.
Mueller, Richard; Kerker, Lothar; and Peuckert, Cornelius, 4,588,850, Cl. 585-539.000.

Hugelshofer, Paul, to Ciba-Geigy Corporation. Solid formulations of dyes which are sparingly soluble or insoluble in water. 4,588,412, Cl. 8-524.000.

Hughes Aircraft Company: *See*—
Eisenhart, Robert L., 4,588,963, Cl. 331-56.000.
Maranto, Jack J., 4,588,257, Cl. 350-96.210.
Tang, Raymond; and Hellums, Joseph M., 4,588,994, Cl. 343-754.000.

Humbert, Daniel; Gasc, Jean-Claude; and Hunt, Peter F., to Roussel Uclaf. Derivatives of isoxazolo[4,5-c]quinoline(2H)-3-one and method of preparation and use as anxiolytic agents. 4,588,731, Cl. 514-293.000.

Humm, Patrick A.: *See*—
Christian, Donald J.; and Humm, Patrick A., 4,589,141, Cl. 382-14.000.

Hunt, Clifford L., to Hunt, Clifford L. Garden hose storage container. 4,588,083, Cl. 206-389.000.

Hunt, Harold R.: *See*—
Murray, Norman R.; and Hunt, Harold R., 4,588,024, Cl. 165-109.100.

Hunt, Peter F.: *See*—
Humbert, Daniel; Gasc, Jean-Claude; and Hunt, Peter F., 4,588,731, Cl. 514-293.000.

Hunter Douglas Inc.: *See*—
Anderson, Richard N., 4,588,012, Cl. 160-174.000.

Hunter, Travis L., to PC Manufacturing Corp. Masking paper and tape dispenser. 4,588,469, Cl. 156-527.000.

Hurlburt, Joseph C., to Sperry Corporation. Air filtration system for harvester operator cab. 4,587,890, Cl. 98-2.110.

Husky Injection Molding Systems Ltd.: *See*—
Schad, Robert D., 4,588,364, Cl. 425-135.000.
Schad, Robert D., 4,588,367, Cl. 425-549.000.

Husted, Raymond R.: *See*—
Downing, Curtis B.; Wilczek, Stephen P.; Ziehm, Richard T.; Federico, Anthony M.; Husted, Raymond R.; and Edmunds, Michael E., 4,589,090, Cl. 364-900.000.

Hutchins, Clinton E.: *See*—
Nguyen, Trung H.; and Hutchins, Clinton E., 4,588,486, Cl. 204-129.430.

Hutschenreuther AG: *See*—
Buhler, Eugen; Strobel, Klaus; and Schwarzmeier, Karl, 4,588,368, Cl. 425-546.000.

Hutter, Ernest, to United States of America, Energy. Automatic coolant flow control device for a nuclear reactor assembly. 4,588,549, Cl. 376-352.000.

Huttlin, Herbert. Fluidized bed apparatus. 4,587,744, Cl. 34-57.00R.

Hwang, Edward F.: *See*—
Okamoto, Yoshiyuki; and Hwang, Edward F., 4,588,792, Cl. 526-90.000.
Hyde, Patrick C.; and Burroughs, Van C., to Western Company of North America, The. Proppant concentrator. 4,588,509, Cl. 210-788.000.
Hydro-Quebec: *See*—
Desrochers, Gerard; Dubreuil, Louis; and Grumich, Joseph, 4,588,036, Cl. 175-58.000.
Simoneau, Raynald, 4,588,440, Cl. 75-126.00B.
I I. E. Innovation Enterprise Ltd.: *See*—
Van Gils, Adrianus W.; and Boogaart, Abraham V. D., 4,588,035, Cl. 175-48.000.
Ice, Roger L. Electrode extension holders. 4,588,252, Cl. 339-268.00R.
Ichikawa, Shunji: *See*—
Teranishi, Masayuki; Murakata, Chikara; Matsukuma, Ikuo; Shuto, Katsuichi; and Ichikawa, Shunji, 4,588,729, Cl. 514-263.000.
Ichizawa, Yoshiyuki; Nomoto, Tsugio; and Oshida, Mamoru, to Yoshino Kogyosho Co., Ltd. Device for removing and conveying injection-molded piece. 4,588,370, Cl. 425-526.000.
Ideal Security Hardware Corporation: *See*—
Miller, Cardell E.; Tracy, Gene A.; Engstrom, George L.; and Thorson, John, 4,588,221, Cl. 292-348.000.
Igari, Akira; and Isono, Keinosuke, to Terumo Kabushiki Kaisha. Connector for medical tubing and medical solution bag device using the connector. 4,588,402, Cl. 604-408.000.
Iijima, Takaaki; Nishiura, Takeshi; Inomata, Ryuji; Tanaka, Eiji; and Suzuki, Hideaki, to Nissan Motor Co., Ltd. Article having cast metal portion and sintered metallic portion and method of producing same. 4,588,551, Cl. 419-2.000.
Iizuka, Hisatsugu: *See*—
Mishina, Hidetoshi; Takahashi, Hiroshi; Iizuka, Hisatsugu; Nakanishi, Noriyoshi; Tateno, Noriaki; and Toeda, Shigetoshi, 4,587,941, Cl. 123-550.000.
Ikeda, Hideo, to Fuji Photo Film Co., Ltd. Silver halide photographic material and development method. 4,588,678, Cl. 430-420.000.
Ikeda, Mitsuhiro: *See*—
Kuboki, Shigeo; Ikeda, Mitsuhiro; Takano, Akihiko; Nishio, Yoji; and Masuda, Ikuro, 4,589,007, Cl. 357-45.000.
Ikekawa, Nobuo: *See*—
DeLuca, Hector F.; Ikekawa, Nobuo; and Tanaka, Yoko, 4,588,528, Cl. 260-397.200.
Ikenoue, Yutaka; Endoh, Hiroyuki; and Hayasaka, Tadao. Process for the preparation of sintered alloys for valve mechanism parts for internal combustion engines. 4,588,441, Cl. 75-230.000.
Ikoma, Mitugi: *See*—
Maruyama, Tsutomu; Ikoma, Mitugi; and Satoh, Kiyoe, 4,588,601, Cl. 426-574.000.
Ikonen, Alpo; Lehtolahti, Raimo; and Mustalampi, Reino, to Allaway Oy. Mounting piece for suction hose of a central vacuum cleaning system. 4,587,687, Cl. 15-314.000.
Illguth, Frank J. Pipe bending tool. 4,587,832, Cl. 72-459.000.
Illinois Tool Works Inc.: *See*—
Ruehl, William E.; and DeMarco, Joseph P., 4,588,152, Cl. 248-71.000.
Imai, Masafumi; Yamamoto, Tadashi; Furuhashi, Hiroyuki; Ueno, Hiroshi; and Inaba, Naomi, to Toa Nenryo Kogyo Kabushiki Kaisha. Catalyst component for polymerization of olefins. 4,588,793, Cl. 526-124.000.
Imai, Takaichi; Yamada, Takeshi; Sakaue, Kunio; Isoyama, Eizo; Mizoguchi, Masaaki; and Tanaka, Katsumi, to Showa Aluminum Corporation. Aluminum heat exchanger provided with fins having hydrophilic coating. 4,588,025, Cl. 165-133.000.
Imai, Tsunemichi: *See*—
Nishida, Yoshinori; Imai, Tsunemichi; and Matsubara, Hiromi, 4,587,707, Cl. 29-527.700.
Imani, Kambiz: *See*—
Mansouri, Mansour N.; Mansouri, Masoud N.; and Imani, Kambiz, 4,587,681, Cl. 5-8.000.
Imazeki, Ryoji; and Kurakake, Mitsuo, to Fanuc Ltd. Numerical control device. 4,589,091, Cl. 364-900.000.
Imazeki, Shuji: *See*—
Kaneko, Masaharu; Yoneyama, Tomio; Iwanami, Junko; Imazeki, Shuji; Mukoh, Akio; and Sato, Mikio, 4,588,517, Cl. 252-299.100.
Imizu, Yuzo: *See*—
Klabunde, Kenneth J.; and Imizu, Yuzo, 4,588,708, Cl. 502-241.000.
Imoto, Manabu, to Asahi Kogaku Kogyo Kabushiki Kaisha. Document size reading device for continuously variable magnification type copying machine. 4,588,289, Cl. 355-57.000.
Imperial Group PLC: *See*—
Adams, Peter I.; Bryant, Raymond A.; and Knapman, William, 4,587,982, Cl. 131-336.000.
Impink, Albert J., Jr.; and Langford, Francis L., Jr., to Westinghouse Electric Corp. Method and apparatus for determining the nearness to criticality of a nuclear reactor. 4,588,547, Cl. 376-254.000.
Imura, Takeshi: *See*—
Saitoh, Shigeru; Shimada, Masaaki; and Imura, Takeshi, 4,588,562, Cl. 422-245.000.
Inaba, Naomi: *See*—
Imai, Masafumi; Yamamoto, Tadashi; Furuhashi, Hiroyuki; Ueno, Hiroshi; and Inaba, Naomi, 4,588,793, Cl. 526-124.000.
Inazaki, Koji; Nangai, Takashi; Fujimori, Yasutomo; and Kimura, Hiroichi, to Nippon Steel Corporation; and Tokyo Shibaura Denki Kabushiki Kaisha. Optical profile measuring method. 4,588,297, Cl. 356-376.000.
Inbar, Dan; Gafni, Giora; Grimberg, Ernest; and Koren, Jacob, to Elscint, Ltd. Gamma camera correction system and method for using the same. 4,588,897, Cl. 250-363.00S.
Index-Werke KG Hahn & Tessky: *See*—
Lahm, Heinrich, 4,587,871, Cl. 82-2.00R.
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Link, Helmut F.; and Grossmann, Walter, 4,587,697, Cl. 29-27.00C.
Ingendoh, Axel; Meyer, Horst; and Garthoff, Bernward, to Bayer Aktiengesellschaft. Aminoalkyl-imidazothiadiazole-alkenecarboxylic acid amides, intermediates for their preparation and their use in medicaments. 4,588,723, Cl. 514-231.000.
Inglis, Ronald T., to General Dynamics Pomona Division. Missile tail fin assembly. 4,588,145, Cl. 244-3.240.
Ingram, Alvin R., to Atlantic Richfield Company. Anti-lumping styrene polymer particles for molding foams. 4,588,751, Cl. 521-57.000.
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Patil, Ram S.; Johnson, Donald F.; and Quasney, John T., 4,588,658, Cl. 428-659.000.
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Franck, Jean-Pierre; and Bournonville, Jean-Paul, 4,588,495, Cl. 208-65.000.
Institut Khimii Akademii Nauk SSSR: *See*—
Molodnyakov, Sergei P.; Fedorov, Jury I.; Kuznetsov, Vitaly A.; Egorochkin, Alexei N.; Birjukova, Tamara G.; and Razuvaev, Grigory A., 4,588,671, Cl. 430-191.000.
Instrumentarium Corp.: *See*—
Nieminen, Timo, 4,589,122, Cl. 378-39.000.
Insul Company, Inc.: *See*—
Towns, Jeffrey A., 4,588,170, Cl. 266-225.000.
Integrated Genetics, Inc.: *See*—
Groet, Suzanne; Ostman, Jonathan; and Wydro, Robert, 4,588,682, Cl. 435-6.000.
Intermatic Incorporated: *See*—
Pezzolo, Donald E., 4,588,926, Cl. 315-155.000.
Intermedient GmbH: *See*—
Braun, Bernd, 4,588,461, Cl. 156-143.000.
Intermountain Research & Development Corporation: *See*—
Cyran, Michael J.; and Copenhafer, William C., 4,588,569, Cl. 423-244.000.
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Kreisher, John H.; Belle Isle, Hal D.; and Nalbantian, Charles A., 4,588,491, Cl. 204-299.00R.
International Business Machines Corporation: *See*—
Abbott, Jerry J.; Bierschbach, James E.; Bobo, Keith N.; and Herring, Greg S., 4,589,080, Cl. 364-552.000.
Adams, Gary E., 4,587,835, Cl. 73-23.100.
Anderson, Nathaniel C.; and Jones, Robert E., Jr., 4,589,042, Cl. 360-125.000.
Auslander, Marc A.; Cocke, John; Hao, Hsieh T.; Markstein, Peter W.; and Radin, George, 4,589,065, Cl. 364-200.000.
Auslander, Marc A.; Cocke, John; Hao, Hsieh T.; Markstein, Peter W.; and Radin, George, 4,589,087, Cl. 364-768.000.
Balant, Anne C.; and Grischkowsky, Daniel R., 4,588,957, Cl. 330-4.300.
Bertschy, John R.; Cameron, T. Jay; Deckert, Kenneth L.; and Lee, Sylvia L., 4,589,036, Cl. 360-75.000.
Carter, John L.; and Wegman, Mark N., 4,588,985, Cl. 340-347.0DD.
Cohen, Donald K.; and Yardy, Raymond, 4,588,263, Cl. 350-401.000.
Cuomo, Jerome J.; Kaufman, Harold R.; and Rossnagel, Stephen M., 4,588,490, Cl. 204-298.000.
Finnes, Steven J., 4,588,890, Cl. 250-307.000.
Fowler, Alan B.; and Hartstein, Allan M., 4,587,709, Cl. 29-571.000.
Galand, Claude, 4,589,130, Cl. 381-31.000.
Goff, Willie, Jr., 4,587,727, Cl. 29-830.000.
Griffith, Jonathan H.; Henriques, Everton H.; Kehoe, James L., III; and Suskie, Marshall J., 4,588,471, Cl. 156-652.000.
Jen, Shen; Kabelac, William J.; and Sanders, Ian L., 4,589,037, Cl. 360-77.000.
Karim, Faraydon O., 4,589,112, Cl. 371-37.000.
Ketchen, Mark B., 4,588,947, Cl. 324-201.000.
Matick, Richard E., 4,589,092, Cl. 364-900.000.
Stephens, Lawrence K., 4,588,987, Cl. 340-525.000.
Voegeli, Otto, 4,589,041, Cl. 360-113.000.
International Business Machines Corp. (IBM): *See*—
Bednar, Gregory M., 4,589,142, Cl. 382-37.000.
International Flavors & Fragrances Inc.: *See*—
Boden, Richard M.; and Grim, Claude, 4,587,981, Cl. 131-278.000.
Boden, Richard M.; and McGhie, Joseph A., 4,588,521, Cl. 252-522.00R.
International Standard Electric Corporation: *See*—
Tischer, Kurt M., 4,588,921, Cl. 313-496.000.
International Technical Associates: *See*—
Lovoi, Paul A.; and Frank, Alan M., 4,588,885, Cl. 250-226.000.
International Telephone and Telegraph Corporation: *See*—
Monti, James H., 4,588,866, Cl. 179-100.00R.

Intersystems, Inc.: *See—*
Wade, Franklin J., 4,588,091, Cl. 209-546.000.
InTest Corporation: *See—*
Smith, Nathan R., 4,588,346, Cl. 414-673.000.
Intevep, S.A.: *See—*
Morales, Alfredo L.; Galiasso, Roberto; Carrasquel, Angel R.; and Salazar, Jose A., 4,588,709, Cl. 502-314.000.
Inventio AG: *See—*
Haas, Max, 4,588,049, Cl. 187-56.000.
Ippolito, Ronald A.; and Legg, Ernest L., to Xerox Corporation. Timer manager. 4,589,093, Cl. 364-900.000.
Irvin Industries Inc.: *See—*
Jensen, Kirk, 4,587,695, Cl. 24-634.000.
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Nakamura, Yuzo; Uchino, Fumio; Tateoka, Hitoshi; and Ishibashi, Junichi, 4,587,848, Cl. 73-632.000.
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Ohmori, Takashi; Sato, Isao; Ishibashi, Yoji; Minakawa, Yoshimitsu; Kuroda, Michio; and Tamura, Zensuke, 4,587,809, Cl. 60-737.000.
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Koto, Haruhiko; Okada, Junichi; Ishii, Hiroshi; and Sawada, Kenji, 4,589,000, Cl. 346-140.00R.
Ishii, Toshiyuki: *See—*
Kutsuwa, Yoshikazu; Kitahara, Kouji; and Ishii, Toshiyuki, 4,588,855, Cl. 174-120.0SC.
Ishii, Wataru: *See—*
Nakane, Hisashi; Yokota, Akira; Yabuta, Mitsuo; and Ishii, Wataru, 4,588,675, Cl. 430-325.000.
Ishikawa, Takatoshi; and Nakajima, Junya, to Fuji Photo Film Co., Ltd. Method for processing silver halide color photosensitive materials. 4,588,677, Cl. 430-387.000.
Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See—*
Yoshida, Kazuo; and Umemoto, Tadahiro, 4,588,869, Cl. 219-76.140.
Isogawa, Toshiaki: *See—*
Sato, Joichi; Shiono, Ryuji; Niimura, Tsutomu; Isogawa, Toshiaki; and Sato, Mitsuru, 4,589,021, Cl. 358-164.000.
Isohata, Junji: *See—*
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Igari, Akira; and Isono, Keinosuke, 4,588,402, Cl. 604-408.000.
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Imai, Takaichi; Yamada, Takeshi; Sakaue, Kunio; Isoyama, Eizo; Mizoguchi, Masaaki; and Tanaka, Katsumi, 4,588,025, Cl. 165-133.000.
Israel, Joseph: *See—*
Rodriguez, Richard, Jr.; and Israel, Joseph, 4,587,671, Cl. 2-69.000.
Israeli, Leonardo, to Rockwell International Corporation. Accordion expansion process. 4,588,651, Cl. 428-594.000.
Isuzu Motors Limited: *See—*
Mishina, Hidetoshi; Takahashi, Hiroshi; Iizuka, Hisatsugu; Nakanishi, Noriyoshi; Tateno, Noriaki; and Toeda, Shigetoshi, 4,587,941, Cl. 123-550.000.
Itami, Teruhiko: *See—*
Nishimura, Nobuo; Itami, Teruhiko; Kimoto, Toshifumi; and Saitoh, Koichi, 4,588,995, Cl. 346-74.200.
Itek Corporation: *See—*
Aldrich, Ralph E., 4,588,268, Cl. 350-607.000.
Iten, Clemens A., to American Safety Razor Company. Sleeve for disposable safety razor. 4,587,730, Cl. 30-90.000.
Ito, Hideaki: *See—*
Suzuki, Yasuhiko; and Ito, Hideaki, 4,588,934, Cl. 318-449.000.
Ito, Kunio: *See—*
Fukuchi, Masakazu; Kimura, Kiyoshi; Tarumi, Noriyoshi; Miwa, Tadashi; Okamoto, Yukio; and Ito, Kunio, 4,588,279, Cl. 355-3.0TR.
Ito, Masatoshi: *See—*
Nakagomi, Tamihito; Toriyama, Kazuhisa; and Ito, Masatoshi, 4,588,518, Cl. 252-299.610.
Ito, Toshimitsu: *See—*
Kobayashi, Nobuyuki; Yagi, Katsunori; and Ito, Toshimitsu, 4,587,938, Cl. 123-416.000.
Ito, Yoshitoshi; Takahashi, Yuji; Ayugai, Morikazu; Mizuno, Katsuhiro; and Noguchi, Atomi, to Hitachi, Ltd. Color industrial television camera device for use in a gamma ray environment having a lens system with a spectral transmittance characteristic to enable achieving white balance. 4,589,014, Cl. 358-29.000.
Itoh, Hiromu; Tani, Zempei; and Hachimura, Kenji, to Sharp Kabushiki Kaisha. Digitalized position control for a D.C. motor. 4,588,936, Cl. 318-594.000.
Itou, Hisao: *See—*
Sumita, Osao; Saito, Masayuki; Itou, Hisao; Kobayashi, Masahito; and Furutani, Yasumasa, 4,588,488, Cl. 204-145.00R.
Itou, Shin-ichi: *See—*
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Itsubo, Junichi; Yazaki, Takashi; and Mori, Fumio, to Japan Crown Cork Co., Ltd. Pilfer-proof plastic closure for containers. 4,588,100, Cl. 215-252.000.
ITT Corporation: *See—*
Anhalt, John W.; and Deacon, George R., 4,588,244, Cl. 339-75.00M.
Carter, Nicholas J. R.; and Sutherland, Douglas, 4,588,864, Cl. 179-99.00H.
Middleton, Francisco A.; Das, Santanu; and Carter, Nicholas J. R., 4,589,107, Cl. 370-62.000.
Prather, Donald W.; and Sposito, Richard G., 4,589,106, Cl. 370-58.000.
ITT Industries, Inc.: *See—*
Boehm, Peter; and Wagner, Wilfried, 4,587,885, Cl. 91-376.00R.
Ivanics, Jozsef: *See—*
Gyory, Peter; Galambos, Geza; Kanay, Karoly; Ivanics, Jozsef; Dorman, Gyorgy; Kovacs, Gabor; Stadler, Istvan; Virag, Sandor; Tomoskozi, Istvan; Kormoczky, Peter; and Kovacs, Marianna, 4,588,713, Cl. 514-63.000.
Iwabuchi, Masaburo: *See—*
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Iwamoto, Taro, to Hitachi, Ltd. Article transporting apparatus. 4,588,350, Cl. 414-787.000.
Iwanami, Junko: *See—*
Kaneko, Masaharu; Yoneyama, Tomio; Iwanami, Junko; Imazeki, Shuji; Mukoh, Akio; and Sato, Mikio, 4,588,517, Cl. 252-299.100.
Iwasaki, Kyuhachiro: *See—*
Yamamuro, Tetsu; and Iwasaki, Kyuhachiro, 4,588,998, Cl. 346-140.00R.
Izumi, Eiki: *See—*
Watanabe, Hiroshi; Izumi, Eiki; Aoyagi, Yukio; Honma, Kazuo; and Nakajima, Kichio, 4,587,808, Cl. 60-389.000.
Izumi, Toshiaki: *See—*
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Izumitani, Tetsuro: *See—*
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J. I. Case Company: *See—*
Leonard, Emil T.; and Draney, Robert G., 4,588,034, Cl. 172-40.000.
Jachowicz, Janusz; and Wolfram, Leszek J., to Clairol Incorporated. Hair treatment composition. 4,588,760, Cl. 524-12.000.
Jackson, John E.; Adler, Thomas A.; Quets, Jean M.; and Tucker, Robert C., Jr., to Union Carbide Corporation. High strength, wear and corrosion resistant coatings and method for producing the same. 4,588,608, Cl. 427-34.000.
Jacobs, Harold, deceased: *See—*
Horn, Robert E.; Jacobs, Harold, deceased; and Hao, Hsieh T., 4,588,966, Cl. 331-96.000.
Horn, Robert E.; and Jacobs, Harold, deceased, 4,588,967, Cl. 331-107.00G.
Jacobs, Lydia S., executrix: *See—*
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Horn, Robert E.; and Jacobs, Harold, deceased, 4,588,967, Cl. 331-107.00G.
Jacobson, Chester F., to Gillette Company, The. Safety razor. 4,587,729, Cl. 30-41.000.
Jacquesy, Jean-Claude: *See—*
Morellet, Guy; Jacquesy, Jean-Claude; and Jouannetaud, Marie-Paule, 4,588,841, Cl. 564-443.000.
Jain, Sangya: *See—*
Kelly, Michael; Mammato, Donald C.; Durham, Dana; Jain, Sangya; and Crane, Lawrence, 4,588,670, Cl. 430-165.000.
Jakubaschk, Horst; and Weisser, Erich, to Heckler & Koch GmbH. Magazine for a small arm. 4,587,756, Cl. 42-50.000.
James, David R., to James Industries Limited. Supports for hoists. 4,588,155, Cl. 248-205.100.
James Industries Limited: *See—*
James, David R., 4,588,155, Cl. 248-205.100.
James River Corporation of Virginia: *See—*
Rossi, Alfred F.; Johns, Albert D.; Malakhow, Walter; and Michalec, George W., 4,588,539, Cl. 264-40.500.
Jangaard, Erling S., to Ruvo Automation Corp. High speed hopper fed trim saw. 4,588,006, Cl. 144-3.00R.
Janssen Pharmaceutica N.V.: *See—*
Janssens, Frans E.; Torremans, Joseph L. G.; Hens, Jozef F.; and Van Offenwert, Theophilus T. J. M., 4,588,722, Cl. 514-228.000.
Janssens, Frans E.; Torremans, Joseph L. G.; Hens, Jozef F.; and Van Offenwert, Theophilus T. J. M., to Janssen Pharmaceutica N.V. N-(4-piperidinyl) bicyclic condensed 2-imidazolamine derivatives. 4,588,722, Cl. 514-228.000.
Japan Atomic Energy Research Institute: *See—*
Matsuoka, Mamoru, 4,588,952, Cl. 324-409.000.
Japan Crown Cork Co., Ltd.: *See—*
Itsubo, Junichi; Yazaki, Takashi; and Mori, Fumio, 4,588,100, Cl. 215-252.000.
Japan Metals and Chemicals Co., Ltd.: *See—*
Nakamura, Teruo; Kiyoto, Michio; Akashi, Kazuo; and Hasegawa, Isao, 4,588,431, Cl. 71-24.000.

Japan Synthetic Rubber Co., Ltd.: *See—*
Ono, Hisao; Tsutsumi, Fumio; Sakakibara, Mitsuhiko; and Okuya, Eitaro, 4,588,782, Cl. 525-245.000.

Japan Tobacco & Salt Public Corporation, The: *See—*
Nambu, Yutaka; Sugawara, Hitosi; and Saitoh, Yasuo, 4,587,743, Cl. 34-31.000.

Jarvis, Edward E.: *See—*
Butler, Joseph W.; and Jarvis, Edward E., 4,587,852, Cl. 73-826.000.

Jaselli, Franco, to Microelettrica Scientifica S.P.S. Resistors obtained from sheet material. 4,588,976, Cl. 338-284.000.

Jaspon, Lawrence E. Tire sealant composition. 4,588,758, Cl. 523-166.000.

Jay, Eric C., to Jay Medical, Ltd. Seat cushion. 4,588,229, Cl. 297-459.000.

Jay Medical, Ltd.: *See—*
Jay, Eric C., 4,588,229, Cl. 297-459.000.

Jayadev, Tumkur S.; Van Nguyen, On; Reyes, Jaime M.; Davis, Helen; and Putty, Michael W., to Energy Conversion Devices, Inc. Powder pressed thermoelectric materials and method of making same. 4,588,520, Cl. 252-512.000.

Jaye-Boern Laboratories, Inc.: *See—*
Bernstein, Joel E., 4,588,590, Cl. 424-195.100.

Jean Walterscheid GmbH: *See—*
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Jeluso, Cheryl L.: *See—*
Wissman, Lance R.; Bouwer, Sandra D.; and Jeluso, Cheryl L., 4,587,983, Cl. 132-73.000.

Jen, Shen; Kabelac, William J.; and Sanders, Ian L., to International Business Machines Corporation. Servo control system using a varying frequency servo pattern for read/write head positioning in a magnetic recording disk file. 4,589,037, Cl. 360-77.000.

Jenkins, Cecil: *See—*
Woolslayer, Homer J.; and Jenkins, Cecil, 4,587,778, Cl. 52-116.000.

Jenkins, John M., III; Jones, Russell L.; Jones, Thomas M.; and Beret, Samil, to Union Carbide Corporation. Method for fluidized bed polymerization. 4,588,790, Cl. 526-70.000.

Jensen, Kirk, to Irvin Industries Inc. Snap-in latch mounting brackets. 4,587,695, Cl. 24-634.000.

Jeol Ltd.: *See—*
Naito, Motohiro, 4,588,889, Cl. 250-295.000.

Jeschke, Willi, to Heidelberger Druckmaschinen AG. Method of flow-feeding sheets. 4,588,184, Cl. 271-237.000.

Jidosha Kiki Co., Ltd.: *See—*
Masuda, Naosuke; and Sonoda, Hirotetsu, 4,587,886, Cl. 91-415.000.
Ohki, Junichi; Gotoh, Yuzoh; and Kamei, Takanao, 4,587,889, Cl. 92-98.00D.

Jimenez, Raul. Grass trimming and edging device. 4,587,800, Cl. 56-16.900.

Jinushi, Michio: *See—*
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Jodry, Francois: *See—*
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Johal, Sarjit S. Method for preparation of Fraction I protein and by-products thereof. 4,588,691, Cl. 530-379.000.

Johansson, Anders: *See—*
Blomstrand, Jan; Johansson, Anders; Junkrans, Sigvard; Nylund, Olov; and van Santen, Aart, 4,588,550, Cl. 376-438.000.

Johansson, Henrik: *See—*
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John Fluke Mfg. Co., Inc.: *See—*
Strong, Norman H., 4,588,983, Cl. 340-347.0NT.

John Guest Limited: *See—*
Guest, Timothy S., 4,588,214, Cl. 285-323.000.

Johns, Albert D.: *See—*
Rossi, Alfred F.; Johns, Albert D.; Malakhow, Walter; and Michalec, George W., 4,588,539, Cl. 264-40.500.

Johnson, Donald F.: *See—*
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Johnson & Johnson Products, Inc.: *See—*
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Johnson, Robert R., to Energy Conversion Devices, Inc. Amorphous semiconductor devices having increased switching speed due to dynamic signal conditioning. 4,588,903, Cl. 307-240.000.

Jones, Frank; Reed, David A.; Crompton, Jane A.; and Beramendi, Pedro M., to Lever Brothers Company. Liquid thickened bleaching composition. 4,588,514, Cl. 252-98.000.

Jones, Ralph: *See—*
Porter, John B.; Altmann, David W.; Mattedi, Bruno A.; and Jones, Ralph, 4,589,067, Cl. 364-200.000.

Jones, Robert E., Jr.: *See—*
Anderson, Nathaniel C.; and Jones, Robert E., Jr., 4,589,042, Cl. 360-125.000.

Jones, Robert N.; and Heeks, Robert E., to Xerox Corporation. Electrophotographic imaging member and process comprising sputtering titanium on substrate. 4,588,667, Cl. 430-73.000.

Jones, Russell L.: *See—*
Jenkins, John M., III; Jones, Russell L.; Jones, Thomas M.; and Beret, Samil, 4,588,790, Cl. 526-70.000.

Jones, Thomas M.: *See—*
Jenkins, John M., III; Jones, Russell L.; Jones, Thomas M.; and Beret, Samil, 4,588,790, Cl. 526-70.000.

Jones, Wallace R.: *See—*
Isaksen, Robert A.; Frappier, David E.; and Jones, Wallace R., 4,588,627, Cl. 428-80.000.

Jones, Warren C.: *See—*
Dery, Ronald A.; and Jones, Warren C., 4,588,456, Cl. 156-52.000.

Jonsson, Jan; and Stromberg, Ernst A. O. Grating tool. 4,587,734, Cl. 30-279.00R.

Jordan, Roland H., to Chevron Research Company. Apparatus for collecting an immiscible liquid from the surface of a body of higher density liquid. 4,588,501, Cl. 210-109.000.

Jouannetaud, Marie-Paule: *See—*
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Juglair, Antoine: *See—*
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Julian, Frank M.: *See—*
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Jundt, Werner: *See—*
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Junkrans, Sigvard: *See—*
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Justice, David D.: *See—*
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Justice, Richard M., Jr.; and Hall, David A., to Eli Lilly and Company. Electrochemical reduction of 3-chlorobenzo[b]thiophenes. 4,588,484, Cl. 204-59.00R.

K & S Schrittmotoren GmbH: *See—*
Hetzel, Max, 4,588,143, Cl. 242-1.10R.

Kaartinen, Niilo; and Johansson, Henrik, to Fluilogic Systems Oy. Reagent package. 4,588,554, Cl. 422-61.000.

Kabayama, Yuichi: *See—*
Harumoto, Yoshinobu; Yoshida, Yoshio; Kabayama, Yuichi; Kan, Hisao; Hakata, Tetsuro; and Matsumoto, Takahiro, 4,588,972, Cl. 336-58.000.

Kabelac, William J.: *See—*
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Kabushika Kaisha Meidensha: *See—*
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Kabushiki Kaisha Honma: *See—*
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Kabushiki Kaisha Kobe Seiko Sho: *See—*
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Kabushiki Kaisha Komatsu Seisakusho: *See—*
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Kabushiki Kaisha Morita Seisakusho: *See—*
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Kabushiki Kaisha Tokai-rika-denki-seisakusho: *See—*
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Kabushiki Kaisha Toshiba: *See—*
Hirai, Kenji; and Torizuka, Hideki, 4,588,964, Cl. 331-67.000.
Kako, Takuya, 4,588,352, Cl. 415-110.000.
Yamanishi, Eiichi; Oono, Kenichi; Gokita, Masami; Futaki, Kenji; and Watanabe, Junji, 4,589,035, Cl. 358-296.000.
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Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See—*
Miyazaki, Tsutomu; Fukuda, Tatemi; and Yoshimine, Kazuya, 4,588,063, Cl. 193-27.000.

Kabushiki Kaisha Toyota Chuo Kenkyusho: *See—*
Suzuki, Yasuhiko; and Ito, Hideaki, 4,588,934, Cl. 318-449.000.

Kabushiki Kaisha Yamazaki Tekkosho: *See—*
Miyachi, Chihiro, 4,587,708, Cl. 29-568.000.

Kadelka, Jurgen; and Schwarz, Hans-Helmut, to Bayer Aktiengesellschaft. Process for the preparation of substituted succinic acid amides. 4,588,833, Cl. 560-145.000.

Kaderabek, Milos. Universal napkin support. 4,587,692, Cl. 24-9.000.

Kado, Clarence I.; Rodriguez, Raymond L.; Froman, Byron E.; and Tait, Robert C., to University of California, The Regents of the. Restriction endonuclease XcyI. 4,588,689, Cl. 435-199.000.

Kadomatsu, Yasuo; Tajima, Shoji; Miyazaki, Yoshio; Anze, Kimio; and Sakurai, Michikazu, to Ricoh Company, Ltd. Elastic developer carrier. 4,587,699, Cl. 29-121.100.

Kadono, Hiromitsu; and Natsuume, Tadao, to Nippon Zeon Co., Ltd. Process for producing water-soluble dicarboxylic acid imide compounds. 4,588,786, Cl. 525-327.600.

Kagimoto, Yoshitaka: *See—*
Matsumoto, Kunio; Kagimoto, Yoshitaka; Hirata, Tsutomu; Watanabe, Susumu; Ohtsuka, Akira; and Takahashi, Kiyoharu, 4,588,836, Cl. 562-448.000.

Kaise, Hitoshi, to Nippon Seimitsu Kogyo Kabushiki Kaisha. Iris diaphragm device for a camera. 4,588,276, Cl. 354-271.100.

Kaisen, Kenneth R.: *See—*
Federico, Anthony M.; Kaisen, Kenneth R.; and Legg, Ernest L., 4,588,284, Cl. 355-14.00R.

Kajiura, Hirokazu: *See—*
Oda, Hidekuni; Murata, Kazuhiko; Kajiura, Hirokazu; and Matsuda, Akira, 4,588,794, Cl. 526-169.200.

Kakeshita, Yoshiaki: *See—*
Yamada, Yoji; Matsuura, Michinori; and Kakeshita, Yoshiaki, 4,587,855, Cl. 73-862.480.

Kako, Takuya, to Kabushiki Kaisha Toshiba. Multistage hydraulic machine. 4,588,352, Cl. 415-110.000.

Kalasz, Huba: *See—*
Knoll, Jozsef; Nagy, Janos; Kalasz, Huba; and Knoll, Berta, 4,588,685, Cl. 435-69.000.

Kaldenbach, Erwin, to Lindemann Maschinenfabrik GmbH. Refuse packaging assembly. 4,588,003, Cl. 141-71.000.

Kam, Anthony Y.; Krambeck, Frederick J.; and Schatz, Klaus W., to Mobil Oil Corporation. Closed FCC cyclone system. 4,588,558, Cl. 422-113.000.

Kamei, Takanao: *See—*
Ohki, Junichi; Gotoh, Yuzoh; and Kamei, Takanao, 4,587,889, Cl. 92-98.00D.

Kameyama, Tetsuya: *See—*
Fujishige, Masao; Dokiya, Masayuki; Kameyama, Tetsuya; Yokokawa, Harumi; Ujiie, Seiichi; and Fukuda, Kenzo, 4,588,438, Cl. 75-68.00A.

Kaminski, Elton G., to Stolle Corporation, The. Article feeding apparatus with non-flexing belt. 4,588,066, Cl. 198-345.000.

Kan, Hisao: *See—*
Harumoto, Yoshinobu; Yoshida, Yoshio; Kabayama, Yuichi; Kan, Hisao; Hakata, Tetsuro; and Matsumoto, Takahiro, 4,588,972, Cl. 336-58.000.

Kanai, Seita: *See—*
Kanazawa, Hirotaka; Kanai, Seita; and Nakatani, Shirou, 4,588,198, Cl. 280-90.000.

Kanamori, Takashi, to Yamaha Hatsudoki Kabushiki Kaisha. Braking arrangement for wheeled vehicle. 4,588,200, Cl. 280-269.000.

Kanay, Karoly: *See—*
Gyory, Peter; Galambos, Geza; Kanay, Karoly; Ivanics, Jozsef; Dorman, Gyorgy; Kovacs, Gabor; Stadler, Istvan; Virag, Sandor; Tomoskozi, Istvan; Kormoczky, Peter; and Kovacs, Marianna, 4,588,713, Cl. 514-63.000.

Kanazawa, Hirotaka; Kanai, Seita; and Nakatani, Shirou, to Mazda Motor Corporation. Steering system having controllable damper. 4,588,198, Cl. 280-90.000.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See—*
Hamaguchi, Shigeki; Yamamura, Hiroshi; Hasegawa, Junzo; Kawaharada, Hajime; and Watanabe, Kiyoshi, 4,588,694, Cl. 435-280.000.
Sakurai, Yoshifumi; Numata, Takuhisa; Saito, Kazuo; and Saiki, Koji, 4,588,647, Cl. 428-457.000.

Kanehara, Kenji: *See—*
Tokura, Norihito; Kawai, Hisasi; Kanehara, Kenji; and Kohama, Tokio, 4,587,843, Cl. 73-204.000.

Kaneiwa, Toshiyuki; and Shimamoto, Mamoru, to Nippondenso Co., Ltd. Method for controlling automobile device when sensor output is abnormal. 4,588,935, Cl. 318-483.000.

Kaneko, Kenji; Okabe, Takahiro; and Nagata, Minoru, to Hitachi, Ltd. IIL semiconductor memory including arrangement for preventing information loss during read-out. 4,589,096, Cl. 365-154.000.

Kaneko, Masaharu; Yoneyama, Tomio; Iwanami, Junko; Imazeki, Shuji; Mukoh, Akio; and Sato, Mikio, to Hitachi, Ltd.; and Mitsubishi Chemical Industries, Ltd. Liquid crystal composition. 4,588,517, Cl. 252-299.100.

Kaneko, Tetsuya; Kitahara, Toshio; and Kaneko, Toyokazu, to Ajinomoto Co., Inc. Method for recovery of optically active tryptophane. 4,588,818, Cl. 548-498.000.

Kaneko, Toyokazu: *See—*
Kaneko, Tetsuya; Kitahara, Toshio; and Kaneko, Toyokazu, 4,588,818, Cl. 548-498.000.

Kang, Young H. Measuring rule with numerical counter. 4,587,738, Cl. 33-139.000.

Kanngiesser, Karl W., to BBC Aktiengesellschaft Brown, Boveri & Cie AG. Control method for a liquid cooled cable installation. 4,588,428, Cl. 62-99.000.

Kanno, Masahide; Amano, Atsushi; Hosoda, Seiichi; and Hattori, Shinichiro, to Olympus Optical Co., Ltd. Light supply apparatus for an endoscope. 4,588,927, Cl. 315-307.000.

Kansas City Southern Railway Company, Inc., The: *See—*
Haney, T. L., 4,587,907, Cl. 105-378.000.

Kansas State University Research Foundation: *See—*
Klabunde, Kenneth J.; and Imizu, Yuzo, 4,588,708, Cl. 502-241.000.

Kanzig, Alex: *See—*
Scheibli, Peter; Kanzig, Alex; and Schaub, Andres, 4,588,411, Cl. 8-528.000.

Kao Corporation: *See—*
Yasuda, Shinichiro; Morimoto, Eiji; and Ueda, Yuichi, 4,588,668, Cl. 430-109.000.

Kaplan, Jean-Pierre, to Synthelabo. Therapeutically useful benzylidene derivatives. 4,588,748, Cl. 514-641.000.

Kaplan, Lester J.; and McMillan, Moses W., to Upjohn Company, The. Analgesic 2-oxa-spirocyclic compounds. 4,588,591, Cl. 514-409.000.

Karas, Nicholas V., to United States of America, Air Force. Intrusion barrier and detection apparatus. 4,588,988, Cl. 340-552.000.

Karim, Faraydon O., to International Business Machines Corporation. System for multiple error detection with single and double bit error correction. 4,589,112, Cl. 371-37.000.

Kartridg Pak Co., The: *See—*
Leonard, George E., 4,588,001, Cl. 141-5.000.

Kashiwagi, Yoshiyuki: *See—*
Noda, Yasushi; and Kashiwagi, Yoshiyuki, 4,588,879, Cl. 200-144.00B.

Kassai, Kenzou, to Aprica Kassai Kabushikikaisha. Handle height adjusting mechanism for a baby carriage. 4,587,864, Cl. 74-551.300.

Kasugai, Joji, to Toyoda Gosei Co., Ltd. Cap with valve. 4,588,102, Cl. 220-203.000.

Kataoka, Shinzi; Shinagawa, Yukio; and Sakaguchi, Shinji, to Fuji Photo Film Co., Ltd. Retouchable mat film. 4,588,673, Cl. 430-264.000.

Kataoka, Shoei: *See—*
Sakai, Shigeki; Tateno, Hiroshi; and Kataoka, Shoei, 4,589,001, Cl. 357-5.000.

Kates, Roger M. Method for converting a steel slitter into a four high cold reduction mill. 4,587,702, Cl. 29-401.100.

Kato Hatsujo Kaisha, Ltd.: *See—*
Matsui, Tatsuhiko; Aida, Hiroyuki; Watanabe, Akira; and Masakazu, Miyoshi, 4,588,220, Cl. 292-338.000.

Kato, Hidenobu: *See—*
Kobayashi, Fumio; and Kato, Hidenobu, 4,588,219, Cl. 292-336.300.

Kato, Nobuhide; and Murase, Takao, to NGK Insulators, Ltd. Oxygen sensor. 4,588,494, Cl. 204-426.000.

Katoh, Michio: *See—*
Tateno, Kenichi; Yokozawa, Masami; Fujii, Hiroyuki; Nishikawa, Mikio; Katoh, Michio; and Wada, Fujio, 4,589,010, Cl. 357-70.000.

Katz, Allen; Sudarsanam, Rajagopalan; and Aubert, Donald E., to RCA Corporation. Adjustable reflective predistortion circuit. 4,588,958, Cl. 330-149.000.

Kauffman, William J.; and Lilley, George L., to Armstrong World Industries, Inc. Process of forming an embossed surface covering having a wear layer attached uniformly thereto. 4,588,545, Cl. 264-46.400.

Kaufman, Arthur; and Werth, John, to Engelhard Corporation. Fabrication of gas impervious edge seal for a bipolar gas distribution assembly for use in a fuel cell. 4,588,661, Cl. 429-36.000.

Kaufman, Harold R.: *See—*
Cuomo, Jerome J.; Kaufman, Harold R.; and Rossnagel, Stephen M., 4,588,490, Cl. 204-298.000.

Kawabe, Masaru: *See—*
Endo, Keizo; Matsumura, Hiroshi; Shimamura, Norio; and Kawabe, Masaru, 4,589,069, Cl. 364-405.000.

Kawaharada, Hajime: *See—*
Hamaguchi, Shigeki; Yamamura, Hiroshi; Hasegawa, Junzo; Kawaharada, Hajime; and Watanabe, Kiyoshi, 4,588,694, Cl. 435-280.000.

Kawai, Hisasi: *See—*
Tokura, Norihito; Kawai, Hisasi; Kanehara, Kenji; and Kohama, Tokio, 4,587,843, Cl. 73-204.000.

Kawai, Yoshio; and Kitagawa, Kiyoshi, to Kureha Kagaku Kogyo Kabushiki Kaisha. Pinch valve device. 4,588,159, Cl. 251-4.000.

Kawano, Kiyoshi: *See—*
Suzuki, Shigeo; Kawano, Kiyoshi; Ogawa, Kimiaki; and Aoki, Harumi, 4,589,023, Cl. 358-213.000.

Kawasaki Steel Corporation: *See—*
Shimizu, Yoh; and Nishide, Teruyuki, 4,588,453, Cl. 148-111.000.

Kawase, Hideyuki, to Hitachi, Ltd. Magnetic head position adjusting mechanism. 4,589,040, Cl. 360-109.000.

Kawashima, Hiroki: *See—*
Tsuchida, Takayasu; Kurahashi, Osamu; Kawashima, Hiroki; Nakamori, Shigeru; and Enei, Hitoshi, 4,588,687, Cl. 435-108.000.

Kawashima, Takuji: *See—*
Okonogi, Shigeo; Kawashima, Takuji; Kudo, Tsutomu; Yuguchi, Hiroya; Hiramatsu, Akinori; Teraguchi, Susumu; and Yaeshima, Tomoko, 4,588,595, Cl. 426-43.000.

Kaydon Corporation: *See—*
Sprenger, Gregory S.; and Knight, Noel E., 4,588,500, Cl. 210-100.000.

Kazama, Seiji: *See—*
Hirokawa, Hideo; Kazama, Seiji; and Takashima, Hisashi, 4,588,342, Cl. 414-125.000.

Kazumi, Jiro, to Canon Kabushiki Kaisha. Data recording control device. 4,588,274, Cl. 354-105.000.

Kehoe, James L., III: *See—*
Griffith, Jonathan H.; Henriques, Everton H.; Kehoe, James L., III; and Suskie, Marshall J., 4,588,471, Cl. 156-652.000.

Keil, Karl-Heinz; Engelhardt, Fritz; Greiner, Ulrich; Sternberger, Klaus; and Pelster, Manfred, to Cassella Aktiengesellschaft. Process for producing dyeings with reactive dyestuffs. 4,588,413, Cl. 8-543.000.

Keil, William: *See—*
Abens, Sandors G.; and Keil, William, 4,588,659, Cl. 429-20.000.

Kelly, Michael; Mammato, Donald C.; Durham, Dana; Jain, Sangya; and Crane, Lawrence, to American Hoechst Corporation. Light-sensitive trisester of O-quinone diazide containing composition for the preparation of a positive-acting photoresist. 4,588,670, Cl. 430-165.000.

Kemmler, Rudolf: *See—*
Heitele, Jurgen; and Kemmler, Rudolf, 4,588,390, Cl. 493-133.000.

Kemp, Willard E. Through conduit gate valve. 4,588,164, Cl. 251-327.000.

Kennedy, Melvin R.; Nagel, Dietmar; and Arad, Abraham A., to Buddy L Corporation. Toy crash vehicle. 4,588,386, Cl. 446-6.000.

Kennett, Leslie P.: *See—*
Tyson, Joseph H.; Kennett, Leslie P.; and Davidson, Iain S., 4,588,376, Cl. 432-36.000.

Kepplinger, Werner; and Hauk, Rolf, to Korf Engineering GmbH; and Voest-Alpine Aktiengesellschaft. Method for producing molten pig iron or steel pre-products in a melt-down gasifier. 4,588,437, Cl. 75-43.000.

Kerker, Lothar: *See—*
Mueller, Richard; Kerker, Lothar; and Peuckert, Cornelius, 4,588,850, Cl. 585-539.000.

Kernforschungszentrum Karlsruhe GmbH: *See—*
Piesch, Ernst; and Burgkhardt, Bertram, 4,588,898, Cl. 250-390.000.

Kerth, Donald A.; and Sooch, Navdeep S., to AT&T Bell Laboratories. Cascode CMOS bandgap reference. 4,588,941, Cl. 323-314.000.

Keshavan, Madapusi K.; and Weatherly, Merle H., to Union Carbide Corporation. Abrasion resistant coating and method for producing the same. 4,588,606, Cl. 427-34.000.

Kessler, David, to Eastman Kodak Company. Apparatus which shapes gaussian beams by spherical mirrors. 4,588,269, Cl. 350-619.000.

Kessler, Jack H.; and Rosenbaum, Robert S. Method for disinfecting a contact lens. 4,588,586, Cl. 424-94.000.

Ketchen, Mark B., to International Business Machines Corporation. Integrated miniature DC SQUID susceptometer for measuring properties of very small samples. 4,588,947, Cl. 324-201.000.

Kettenring, Gerhard: *See—*
Schmitz, Gunther; Greulich, Bodo; and Kettenring, Gerhard, 4,588,105, Cl. 220-359.000.

Khadder, Wadie N.; and Wang, Jia-Tarng, to Linear Technology Corporation. Diffusion of dopant into a semiconductor wafer. 4,588,454, Cl. 148-188.000.

Khan, Mohamed W.: *See—*
Bucher, Doris J.; Khan, Mohamed W.; and Kharitonenkov, Igor G., 4,588,680, Cl. 435-5.000.

Khan, Mohammad A.: *See—*
Daugherty, Charles W.; Khan, Mohammad A.; Lentz, David J.; and Thoresen, Stephen L., 4,588,398, Cl. 604-265.000.

Khanna, Pyare; and Ullman, Edwin F., to Syntex (U.S.A.) Inc. Method for performing fluorescent protein binding assay employing novel alkyl substituted fluorescent compounds and conjugates. 4,588,697, Cl. 436-518.000.

Kharitonenkov, Igor G.: *See—*
Bucher, Doris J.; Khan, Mohamed W.; and Kharitonenkov, Igor G., 4,588,680, Cl. 435-5.000.

Khurana, Sudershan K., to Lockheed Corporation. Adjustable clocking nose piece. 4,588,334, Cl. 408-61.000.

Kibun Company Limited: *See—*
Maruyama, Tsutomu; Ikoma, Mitugi; and Satoh, Kiyoe, 4,588,601, Cl. 426-574.000.

Kidd, Alan L., to Dorman Smith Switchgear Limited. Apparatus for determining prospective short circuit current. 4,589,073, Cl. 364-483.000.

Kiefer, Werner; and Sura, Maria, to Schott Glaswerke. Method of manufacturing porous sintered inorganic bodies with large open pore volume. 4,588,540, Cl. 264-43.000.

Kienzle Apparate GmbH: *See—*
Baur, Rupert; Dietel, Klaus; Stockler, Kurt; and Tauchert, Klaus, 4,589,143, Cl. 382-61.000.

Kikuchi, Kaoru: *See—*
Hada, Kazunari; Fujii, Norio; Azuma, Toru; Kikuchi, Kaoru; and Hazama, Junji, 4,589,139, Cl. 382-8.000.

Kikutsugi, Toshiharu: *See—*
Kitazawa, Yoichi; and Kikutsugi, Toshiharu, 4,588,009, Cl. 152-209.00R.

Kilkson, Henn, to Du Pont de Nemours, E. I., and Company. Platelet storage container. 4,588,401, Cl. 604-408.000.

Killeen, James J.: *See—*
Minnis, Ralph L.; Moschovis, Elias P.; and Killeen, James J., 4,588,757, Cl. 523-406.000.

Kim, Joo H.; and Choi, Rack K. Apparatus for varying eccentrically of the axle of a bicycle wheel. 4,588,232, Cl. 301-1.000.

Kimoto, Toshifumi: *See—*
Nishimura, Nobuo; Itami, Teruhiko; Kimoto, Toshifumi; and Saitoh, Koichi, 4,588,995, Cl. 346-74.200.

Kimura, Hiroichi: *See—*
Inazaki, Koji; Nangai, Takashi; Fujimori, Yasutomo; and Kimura, Hiroichi, 4,588,297, Cl. 356-376.000.

Kimura, Kiyoshi: *See—*
Fukuchi, Masakazu; Kimura, Kiyoshi; Tarumi, Noriyoshi; Miwa, Tadashi; Okamoto, Yukio; and Ito, Kunio, 4,588,279, Cl. 355-3.0TR.

Kindler, Wilfried: *See—*
Depta, Ingolf; and Kindler, Wilfried, 4,588,999, Cl. 346-140.00R.

King, Edgar P.: *See—*
Cologna, Rudy L.; Eng, Melvin D.; and King, Edgar P., 4,588,626, Cl. 428-63.000.

King, Thomas G. Building system. 4,587,787, Cl. 52-648.000.

Kinoshita, Tomoaki, to Tokyo Juki Industrial Co., Ltd. Workpiece holding-down device in a sewing machine. 4,587,911, Cl. 112-239.000.

Kinoshita, Tutomu: *See—*
Shinmura, Tetsuro; and Kinoshita, Tutomu, 4,588,912, Cl. 310-68.00R.

Kinsel, Jane F.: *See—*
Sheth, Bhogilal B.; Gilbert, Sheri A.; and Kinsel, Jane F., 4,588,589, Cl. 424-195.100.

Kinson, Philip L.: *See—*
Aycock, David F.; and Kinson, Philip L., 4,588,806, Cl. 528-215.000.

Kintek, Inc.: *See—*
Blackmer, David E.; and Townsend, James H., Jr., 4,589,129, Cl. 381-21.000.

Kipouras, George P.: *See—*
Federl, Alan R.; and Kipouras, George P., 4,588,773, Cl. 525-64.000.

Kirk, Gregory: *See—*
Gruner, Sol M.; and Kirk, Gregory, 4,588,698, Cl. 436-535.000.

Kirschensteiner, Fred: *See—*
Wiersema, Dale T.; and Kirschensteiner, Fred, 4,587,824, Cl. 72-217.000.

Kis-Tamas, Attila: *See—*
Budai, Zoltan; Kis-Tamas, Attila; Lay nee Konya, Aranka; Vig, Zoltan; Andriska, Viktor; and Mezei, Tibor, 4,588,435, Cl. 71-103.000.

Kiselev, Vladimir G.: *See—*
Fedorov, Svyatoslav N.; Egorova, Eleonora V.; Spiridonov, Oleg P.; Nanushian, Sergei R.; Benenson, Igor L.; Degtev, Evgeny I.; Masterov, Vyacheslav N.; and Kiselev, Vladimir G., 4,588,406, Cl. 623-6.000.

Kishi, Hajimu; and Seki, Masaki, to Fanuc Ltd. Method of creating curved surfaces. 4,589,062, Cl. 364-168.000.

Kitagawa, Kiyoshi: *See—*
Kawai, Yoshio; and Kitagawa, Kiyoshi, 4,588,159, Cl. 251-4.000.

Kitago, Tohshichi; Fujita, Masaharu; and Kumagai, Seishiyo, to Kureha Kagaku Kogyo Kabushiki Kaisha. Method and apparatus for manufacture of laminate of fibrous substance having electrophoretic charge. 4,588,489, Cl. 204-180.900.

Kitahara, Hiroaki, to Anelva Corporation. Thickness monitoring system for intermittently exposing a quartz crystal to a material to be deposited. 4,588,942, Cl. 324-71.500.

Kitahara, Kouji: *See—*
Kutsuwa, Yoshikazu; Kitahara, Kouji; and Ishii, Toshiyuki, 4,588,855, Cl. 174-120.0SC.

Kitahara, Toshio: *See—*
Kaneko, Tetsuya; Kitahara, Toshio; and Kaneko, Toyokazu, 4,588,818, Cl. 548-498.000.

Kitamoto, Tatsuji; Shirahata, Ryuji; Yamada, Yasuyuki; and Akashi, Goro, to Fuji Photo Film Co., Ltd. Method of preparing a magnetic recording medium. 4,588,656, Cl. 428-694.000.

Kitamoto, Tatsuji: *See—*
Shirahata, Ryuji; Yanai, Akio; and Kitamoto, Tatsuji, 4,588,636, Cl. 428-336.000.

Kitamura, Toyohiro: *See—*
Sawada, Takashi; Morimoto, Tomiaki; Miyoshi, Isao; Taguchi, Hirokuni; Tohmatsu, Junichi; and Kitamura, Toyohiro, 4,588,681, Cl. 435-5.000.

Kitano, Hiroshi, to Kabushiki Kaisha Komatsu Seisakusho. Sheet feeding apparatus. 4,588,183, Cl. 271-236.000.

Kitazawa, Yoichi; and Kikutsugi, Toshiharu, to Bridgestone Corporation. Pneumatic tire for motorcycle having an excellent absorbability to external disturbances. 4,588,009, Cl. 152-209.00R.

Kiyoto, Michio: *See—*
Nakamura, Teruo; Kiyoto, Michio; Akashi, Kazuo; and Hasegawa, Isao, 4,588,431, Cl. 71-24.000.

Klaase, Petrus T. A.; and van Turnhout, Jan, to Minnesota Mining and Manufacturing Company. Method for manufacturing an electret filter medium. 4,588,537, Cl. 264-22.000.

Klabunde, Kenneth J.; and Imizu, Yuzo, to Kansas State University Research Foundation. Bimetallic solvated metal atom dispersed catalysts. 4,588,708, Cl. 502-241.000.

Klauke, Erich: *See—*
Baasner, Bernd; Klauke, Erich; and Lantzsch, Reinhard, 4,588,837, Cl. 562-605.000.
Kysela, Ernst; and Klauke, Erich, 4,588,844, Cl. 568-41.000.

Kleibohmer, Friedrich, to Gewerkschaft Eisenhutte Westfalia. Chain conveyor with diverging interleaved scrapers. 4,588,071, Cl. 198-516.000.

Klein, Joseph T.: *See—*
Effland, Richard C.; Klein, Joseph T.; and Hamer, R. Richard L., 4,588,727, Cl. 514-255.000.

Klein, Keith W.; and Arnold, David, to General Electric Company. Molded case circuit breaker with reduced contact mounts. 4,588,878, Cl. 200-153.00G.

Kleinman, Edward F.: *See—*
Pirie, Donald K.; Volkmann, Robert A.; and Kleinman, Edward F., 4,588,527, Cl. 260-245.20R.

Kley, Victor B. Solid state camera. 4,589,030, Cl. 358-225.000.

Kliman, Arthur W.: *See—*
Eldering, Herman G.; and Kliman, Arthur W., 4,588,295, Cl. 356-300.000.

Kling, Waldemar: *See—*
Thoma, Wilhelm; Pedain, Josef; Schroer, Walter; and Kling, Waldemar, 4,588,761, Cl. 524-38.000.

Klinke, Bernard R.: *See—*
Kozak, Norman M.; and Klinke, Bernard R., 4,588,875, Cl. 219-485.000.

Kluck, Detlef: *See—*
Pietsch, Hanns; Hohmann, Volker; and Kluck, Detlef, 4,588,583, Cl. 424-81.000.

Kluksdahl, Harris E., to Chevron Research Company. Extraction of lithium from lithium-containing materials. 4,588,566, Cl. 423-179.500.

Kmecak, Ronald A.: *See—*
Beck, H. Wayne; Carruthers, James D.; Cornelius, Edward B.; Kmecak, Ronald A.; Kovach, Stephen M.; and Hettinger, William P., Jr., 4,588,702, Cl. 502-65.000.

Kmiec, Chester J.; and Novits, Michael F., to Pennwalt Corporation. Foaming and vulcanizing of elastomeric polymers. 4,588,752, Cl. 521-82.000.

Knapman, William: *See—*
Adams, Peter I.; Bryant, Raymond A.; and Knapman, William, 4,587,982, Cl. 131-336.000.

Knappe, Bernhard; and Gerber, Erwin, to FAG Kugelfischer Georg Schafer KGaA. Four-point contact bearing. 4,588,313, Cl. 384-604.000.

Knez, Jordan; and Gartnell, Lars, to Maskinverkstaden Jordan Knez. Apparatus for dispensing spherical objects. 4,588,108, Cl. 221-68.000.

Knight, Noel E.: *See—*
Sprenger, Gregory S.; and Knight, Noel E., 4,588,500, Cl. 210-100.000.

Knoll, Berta: *See—*
Knoll, Jozsef; Nagy, Janos; Kalasz, Huba; and Knoll, Berta, 4,588,685, Cl. 435-69.000.

Knoll, Jozsef; Nagy, Janos; Kalasz, Huba; and Knoll, Berta, to Richter Gedeon Vegyeszeti Gyar Rt. Process for the preparation of a new-type active substance selectively inhibiting food intake. 4,588,685, Cl. 435-69.000.

Knolle, Guy E., Jr., to American Hospital Supply Corporation. Intraocular lens assembly. 4,588,405, Cl. 623-6.000.

Kobayashi, Fumio; and Kato, Hidenobu, to Ohi Seisakusho Co., Ltd.; and Nissan Shatai Co., Ltd. Door handle unit suitable for use in an automobile. 4,588,219, Cl. 292-336.300.

Kobayashi, Masahito: *See—*
Sumita, Osao; Saito, Masayuki; Itou, Hisao; Kobayashi, Masahito; and Furutani, Yasumasa, 4,588,488, Cl. 204-145.00R.

Kobayashi, Mitsugu: *See—*
Takata, Junzo; Jinushi, Michio; Hashizume, Mitsuo; and Kobayashi, Mitsugu, 4,588,124, Cl. 237-1.00R.

Kobayashi, Nobuyuki; Yagi, Katsunori; and Ito, Toshimitsu, to Toyota Jidosha Kabushiki Kaisha. Control device for controlling air-fuel ratio and spark timing of an integral combustion engine. 4,587,938, Cl. 123-416.000.

Kobayashi, Toshio; and Hishiki, Hideo, to Victor Company of Japan, Limited. Device for correcting an image on a picture tube having in-line electron guns and a coil assembly for the device. 4,588,930, Cl. 315-400.000.

Kobe Steel Ltd.: *See—*
Weich, Debra L.; and Pratt, William J., 4,588,057, Cl. 192-3.00R.

Kobel, Alfons: *See—*
Damm, Norbert; and Kobel, Alfons, 4,588,017, Cl. 164-169.000.

Koberstein, Edgar: *See—*
Domesle, Rainer; Koberstein, Edgar; Pletka, Haas-Dieter; and Volker, Herbert, 4,588,707, Cl. 502-225.000.

Kobuke, Takayoshi; Izumi, Toshiaki; Saito, Seitoku; and Fukuda, Kazumasa, to TDK Electronics Co., Ltd. Magnetic recording medium. 4,588,654, Cl. 428-626.000.

Koch, Rudolf; and Herbst, Heiner, to Siemens Aktiengesellschaft. Two-dimensional semiconductor image sensor with regulated integration time. 4,589,024, Cl. 358-213.000.

Kodama, Naoki: *See—*
Suzuki, Ryo; Takeuchi, Teruaki; Takeshita, Masatoshi; Kodama, Naoki; and Sugita, Yutaka, 4,589,095, Cl. 365-43.000.
Takeuchi, Teruaki; Suzuki, Ryo; Kodama, Naoki; Takeshita, Masatoshi; and Sugita, Yutaka, 4,589,094, Cl. 365-36.000.

Koga, Satoru: *See—*
Chiba, Takashi; Koga, Satoru; and Senda, Minji, 4,589,064, Cl. 364-200.000.

Kohama, Tokio: *See—*
Tokura, Norihito; Kawai, Hisasi; Kanehara, Kenji; and Kohama, Tokio, 4,587,843, Cl. 73-204.000.

Kohler, Lothar: *See—*
Egloff, Anton; and Kohler, Lothar, 4,587,998, Cl. 139-448.000.

Kohn, Thomas F.; Garland, Lester L.; and Nelson, Eugene D., to Belco Industries, Inc. Thermocouple probe assembly. 4,588,377, Cl. 432-50.000.

Kohno, Hiroshi; Asao, Haruhiko; Kuwabara, Masao; and Shimizu, Takashi, to Onahama Smelting and Refining Company, Ltd. Process for recovering arsenic trioxide from exhaust gas of smelting. 4,588,564, Cl. 423-87.000.

Koisuka, Mikio; and Aoki, Hisao, to Sanden Corporation. Method for producing an aluminum heat exchanger. 4,587,701, Cl. 29-157.30A.

Koizumi, Osamu: *See—*
Nemoto, Tsuneo; Koizumi, Osamu; and Sugawara, Koukichi, 4,589,105, Cl. 369-291.000.

Kojima, Tadashi, to Tokyo Shibaura Denki Kabushiki Kaisha. Digital waveform conditioning circuit. 4,588,905, Cl. 307-269.000.

Kokosi, Jozsef: *See—*
Hermecz, Istvan; Vasvari nee Debreczy, Lelle; Horvath, Agnes; Kokosi, Jozsef; Virag, Sandor; and Breining, Tibor, 4,588,526, Cl. 260-243.300.

Kokusai Denshin Denwa Kabushiki Kaisha: *See—*
Utaka, Katsuyuki; Sakai, Kazuo; Akiba, Shigeyuki; and Matsushima, Yuichi, 4,589,117, Cl. 372-50.000.

Kokusan Chemical Works Limited: *See—*
Matsumoto, Kunio; Kagimoto, Yoshitaka; Hirata, Tsutomu; Watanabe, Susumu; Ohtsuka, Akira; and Takahashi, Kiyoharu, 4,588,836, Cl. 562-448.000.

Kolbenschmidt Aktiengesellschaft: *See—*
Moebus, Horst, 4,587,932, Cl. 123-41.350.

Kollmeier, Hans-Joachim; and Schloens, Hans-Heinrich, to Th. Goldschmidt AG. Process for the preparation of flexible polyester urethane foams. 4,588,755, Cl. 521-112.000.

Kollner, Hartwig W.: *See—*
Roloff, Herbert F.; and Kollner, Hartwig W., 4,588,975, Cl. 338-5.000.

Komanduri, Ranga; and Reed, William R., Jr., to General Electric Company. Self-sharpening tool constructions having chip-grooves. 4,588,332, Cl. 407-114.000.

Kommanditbolaget Aldolf: *See—*
Adolfsson, Bengt O., 4,588,536, Cl. 261-121.00R.

Komoto, Akira; and Nishio, Akira, to Shimadzu Corporation. Vibration type force detector. 4,587,853, Cl. 73-862.590.

Komoto, Shinsuke, to Asahi Kogaku Kogyo Kabushiki Kaisha. Filter device for reflex optical system zoom lens. 4,588,266, Cl. 350-439.000.

Kondo, Masanao, to Akechi Ceramics Kabushiki Kaisha. Nozzle for continuous casting. 4,588,112, Cl. 222-603.000.

Kondo, Shiro: *See—*
Mizuta, Ken; Kondo, Shiro; and Akazawa, Michitada, 4,588,877, Cl. 200-67.0DB.

Konishi, Keizo. Fluid-filled resilient bushing. 4,588,174, Cl. 267-140.100.

Konishiroku Photo Industry Co., Ltd.: *See—*
Fukuchi, Masakazu; Kimura, Kiyoshi; Tarumi, Noriyoshi; Miwa, Tadashi; Okamoto, Yukio; and Ito, Kunio, 4,588,279, Cl. 355-3.0TR.

Kono, Koichi; Mori, Shoichi; Miyasaka, Kenji; and Tabuchi, Jyoichi, to Toa Nenryo Kogyo Kabushiki Kaisha. Polyethylene microporous membrane of ultra high molecular weight. 4,588,633, Cl. 428-220.000.

Konomi, Masao. Ear microphone. 4,588,867, Cl. 179-107.00E.

Konrad, Eugen; Braun, Hans-Jurgen; and Mager, Herbert, to Wella Aktiengesellschaft. Novel 2-hydroxy-4-aminobenzenes, method for their manufacturing and hair coloring agents containing these compounds. 4,588,410, Cl. 8-421.000.

Kopp, Georg, to SIG Schweizerische Industrie-Gesellschaft. Apparatus for forming a single-fin wrapper sleeve. 4,587,794, Cl. 53-550.000.

Kopp, Manfred K., to United States of America, Energy. Wide-range radiation dose monitor. 4,588,892, Cl. 250-374.000.

Koppe, Herbert: *See—*
Esser, Franz; Koppe, Herbert; Abele, Wolfgang; and Stockhaus, Klaus, 4,588,736, Cl. 514-392.000.

Kordel, Gerhard: *See—*
Bertram, Friedrich; Brede, Uwe; and Kordel, Gerhard, 4,587,903, Cl. 102-216.000.

Kordomenos, Panagiotis I.; Kurple, Kenneth R.; and Alexander, Delores J., to Ford Motor Company. Flexible two component urethane coating compositions. 4,588,787, Cl. 525-440.000.

Koren, Jacob: *See—*
Inbar, Dan; Gafni, Giora; Grimberg, Ernest; and Koren, Jacob, 4,588,897, Cl. 250-363.00S.

Korf Engineering GmbH: *See—*
Kepplinger, Werner; and Hauk, Rolf, 4,588,437, Cl. 75-43.000.

Kormoczky, Peter: *See—*
Gyory, Peter; Galambos, Geza; Kanay, Karoly; Ivanics, Jozsef; Dorman, Gyorgy; Kovacs, Gabor; Stadler, Istvan; Virag, Sandor; Tomoskozi, Istvan; Kormoczky, Peter; and Kovacs, Marianna, 4,588,713, Cl. 514-63.000.

Koster, William H.: *See—*
Bisacchi, Gregory S.; and Koster, William H., 4,588,828, Cl. 549-548.000.

Koto, Haruhiko; Okada, Junichi; Ishii, Hiroshi; and Sawada, Kenji, to Epson Corporation. Ink jet printer of the ink-on-demand type. 4,589,000, Cl. 346-140.00R.

Kotyuk, Bernard L.: *See—*
Vehmas, Olavi E.; Kotyuk, Bernard L.; and Pallo, John M., 4,588,769, Cl. 524-448.000.

Kouda, Tadayuki: *See—*
Oono, Junji; Yano, Kenichi; Sato, Junichi; Kouda, Tadayuki; Ogawa, Yoichiro; Yokoi, Kouichi; and Nakashima, Toshiaki, 4,588,822, Cl. 549-417.000.

Kovach, Stephen M.: *See—*
Beck, H. Wayne; Carruthers, James D.; Cornelius, Edward B.; Kmecak, Ronald A.; Kovach, Stephen M.; and Hettinger, William P., Jr., 4,588,702, Cl. 502-65.000.

Kovacs, Gabor: *See—*
Gyory, Peter; Galambos, Geza; Kanay, Karoly; Ivanics, Jozsef; Dorman, Gyorgy; Kovacs, Gabor; Stadler, Istvan; Virag, Sandor; Tomoskozi, Istvan; Kormoczky, Peter; and Kovacs, Marianna, 4,588,713, Cl. 514-63.000.

Kovacs, Marianna: *See—*
Gyory, Peter; Galambos, Geza; Kanay, Karoly; Ivanics, Jozsef; Dorman, Gyorgy; Kovacs, Gabor; Stadler, Istvan; Virag, Sandor; Tomoskozi, Istvan; Kormoczky, Peter; and Kovacs, Marianna, 4,588,713, Cl. 514-63.000.

Koyama, Tsuneyuki, to Victor Company of Japan, Ltd. State indicator device for indicating states of recording and tape. 4,589,045, Cl. 360-137.000.

Koyama, Yasuo: *See—*
Shimizu, Shinichi; Rikiishi, Tetuo; and Koyama, Yasuo, 4,588,134, Cl. 241-21.000.

Kozak, Norman M.; and Klinke, Bernard R., to A. O. Smith Corporation. Multiple load control apparatus with load equalization. 4,588,875, Cl. 219-485.000.

Krage, Mark K., to General Motors Corporation. Microwave piston position location. 4,588,953, Cl. 324-58.50C.

Kraiss, Richard, to Georg Prinzing GmbH & Co. KG Betonformen- and Maschinenfabrik. Method and apparatus for forming concrete articles containing one or more projecting elements. 4,588,544, Cl. 264-277.000.

Krambeck, Frederick J.: *See*—
Kam, Anthony Y.; Krambeck, Frederick J.; and Schatz, Klaus W., 4,588,558, Cl. 422-113.000.

Krampe, Josef. Tool for cutting and stripping cable. 4,587,731, Cl. 30-90.100.

Krauchick, Walter. Helicopter rescue device. 4,588,148, Cl. 244-137.00P.

Kraus, James H., to Garrett Corporation, The. Constant speed drive system and planetary gear drive therefor. 4,587,866, Cl. 74-691.000.

Kreisher, John H.; Belle Isle, Hal D.; and Nalbantian, Charles A., to International Biotechnologies, Inc. Horizontal gel electrophoresis device. 4,588,491, Cl. 204-299.00R.

Kress, Jack L., to Oscar Mayer Foods Corporation. Process for eviscerating an avian carcass. 4,587,690, Cl. 17-52.000.

Kristiansson, Krister: *See*—
Malmqvist, Erik L.; and Kristiansson, Krister, 4,587,847, Cl. 73-432.00R.

Kriz, Helmut: *See*—
Lindner, Friedrich; and Kriz, Helmut, 4,587,902, Cl. 102-213.000.

Kriz, Karel; and Minnis, Ralph L, to DeSoto, Inc. Aqueous dielectric coatings based on copolymers of high acid content. 4,588,649, Cl. 428-511.000.

Kroontje, Wiggert; and Oostvogels, Franciscus M. P., to U.S. Philips Corporation. Low-pressure alkali metal vapor discharge lamp with arc tube gettering. 4,588,919, Cl. 313-25.000.

Krueger, Duane A.; and Odorzynski, Thomas W., to American Can Company. Multiple layer plastic film having polypropylene adhered to nylon. 4,588,648, Cl. 428-475.800.

Krumrein, Gerhard, to TELEFUNKEN electronic GmbH. Protection circuit for integrated circuits. 4,589,049, Cl. 361-56.000.

Kruse, Wilbur F. Ventilating device and method for making the same. 4,587,891, Cl. 98-29.000.

Kuboki, Shigeo; Ikeda, Mitsuhiro; Takano, Akihiko; Nishio, Yoji; and Masuda, Ikuro, to Hitachi, Ltd.; and Hitachi Engineering Co., Ltd. Semiconductor integrated circuit device. 4,589,007, Cl. 357-45.000.

Kudo, Tsutomu: *See*—
Okonogi, Shigeo; Kawashima, Takuji; Kudo, Tsutomu; Yuguchi, Hiroya; Hiramatsu, Akinori; Teraguchi, Susumu; and Yaeshima, Tomoko, 4,588,595, Cl. 426-43.000.

Kuehnhanss, Gerhard O.: *See*—
Shepherd, Lawrence H., Jr.; DeWitt, William J.; and Kuehnhanss, Gerhard O., 4,588,534, Cl. 260-513.00R.

Kuhla, Donald E.: *See*—
Studt, William L.; Kuhla, Donald E.; and Campbell, Henry F., 4,588,719, Cl. 514-212.000.

Kuhn-Kuhnenfeld, Franz: *See*—
Buchner, Alfred; Kuhn-Kuhnenfeld, Franz; and Auer, Walter, 4,587,771, Cl. 51-281.0SF.

Kuhn, Vincent R., to Dearborn Chemical Company. Method of inhibiting corrosion of iron base metals. 4,588,519, Cl. 252-389.00R.

Kuisma, Heikki T., to Vaisala Oy. Capacitive pressure detector independent of temperature. 4,589,054, Cl. 361-283.000.

Kujas, Erich F., to RCA Corporation. Solder composition. 4,588,657, Cl. 428-641.000.

Kukes, Simon G.; and Parrott, Stephen L., to Phillips Petroleum Company. Phosphorus containing hydrofining catalysts. 4,588,706, Cl. 502-211.000.

Kumagai, Seishiyo: *See*—
Kitago, Tohshichi; Fujita, Masaharu; and Kumagai, Seishiyo, 4,588,489, Cl. 204-180.900.

Kume, Masao: *See*—
Miyatake, Satoshi; Abe, Mitsuo; and Kume, Masao, 4,587,766, Cl. 51-95.0GH.

Kumura, Haruyoshi: *See*—
Yamamuro, Sigeaki; Abo, Keiju; Tanaka, Yoshikazu; Kumura, Haruyoshi; Hirano, Hiroyuki; and Morimoto, Yoshiro, 4,589,071, Cl. 364-424.100.

Kunzweiler, John J.: *See*—
Silay, Louis E.; Stein, James S.; and Kunzweiler, John J., 4,588,231, Cl. 299-39.000.

Kupczik, Gunter. Bearing arrangement to be submerged in water or a slurry. 4,588,310, Cl. 384-152.000.

Kurahashi, Osamu: *See*—
Tsuchida, Takayasu; Kurahashi, Osamu; Kawashima, Hiroki; Nakamori, Shigeru; and Enei, Hitoshi, 4,588,687, Cl. 435-108.000.

Kurakake, Mitsuo: *See*—
Imazeki, Ryoji; and Kurakake, Mitsuo, 4,589,091, Cl. 364-900.000.

Kurashiki Boseki Kabushiki Kaisha: *See*—
Miyagi, Tokuya; Inoue, Akihisa; Hamada, Katushi; Fujimori, Shoichi; and Hori, Yoshihiro, 4,588,464, Cl. 156-218.000.

Kurbitz, Gunther, to Carl-Zeiss-Stiftung. Device for the transmission of information. 4,588,895, Cl. 250-551.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Kawai, Yoshio; and Kitagawa, Kiyoshi, 4,588,159, Cl. 251-4.000.
Kitago, Tohshichi; Fujita, Masaharu; and Kumagai, Seishiyo, 4,588,489, Cl. 204-180.900.
Saitoh, Shigeru; Shimada, Masaaki; and Imura, Takeshi, 4,588,562, Cl. 422-245.000.

Kurihara, Hiroshi: *See*—
Saito, Toshiyuki; Tokumitsu, Yasuyuki; Okubo, Naofumi; Daido, Yoshimasa; and Kurihara, Hiroshi, 4,588,962, Cl. 330-286.000.

Kuroda, Michio: *See*—
Ohmori, Takashi; Sato, Isao; Ishibashi, Yoji; Minakawa, Yoshimitsu; Kuroda, Michio; and Tamura, Zensuke, 4,587,809, Cl. 60-737.000.

Kurple, Kenneth R.: *See*—
Kordomenos, Panagiotis I.; Kurple, Kenneth R.; and Alexander, Delores J., 4,588,787, Cl. 525-440.000.

Kushner, Burton A., to Eutectic Corporation. Ceramic flame spray powder. 4,588,655, Cl. 428-633.000.

Kusumi, Saburo: *See*—
Ogawa, Yukihiko; Kusumi, Saburo; Fukuda, Michio; Okunishi, Toshifumi; Miwa, Sinkichi; and Ohta, Yosinobu, 4,587,725, Cl. 29-753.000.

Kutsuwa, Yoshikazu; Kitahara, Kouji; and Ishii, Toshiyuki, to DuPont-Mitsui Polychemicals Co., Ltd. Semiconducting compositions and wires and cables using the same. 4,588,855, Cl. 174-120.0SC.

Kuwabara, Masao: *See*—
Kohno, Hiroshi; Asao, Haruhiko; Kuwabara, Masao; and Shimizu, Takashi, 4,588,564, Cl. 423-87.000.

Kuwica, Daniel. Filing device for chain saw chain depth gauges. 4,587,868, Cl. 76-36.000.

Kuznetsov, Vitaly A.: *See*—
Molodnyakov, Sergei P.; Fedorov, Jury I.; Kuznetsov, Vitaly A.; Egorochkin, Alexei N.; Birjukova, Tamara G.; and Razuvaev, Grigory A., 4,588,671, Cl. 430-191.000.

Kydd, Gwendolyn C.: *See*—
Goodhue, Charles T.; Kydd, Gwendolyn C.; Foster, Charles H.; and McCombs, Charles A., 4,588,683, Cl. 435-59.000.

Kyocera Corp.: *See*—
Mishina, Hidetoshi; Takahashi, Hiroshi; Iizuka, Hisatsugu; Nakanishi, Noriyoshi; Tateno, Noriaki; and Toeda, Shigetoshi, 4,587,941, Cl. 123-550.000.

Kyowa Hakko Kogyo Co., Ltd.: *See*—
Teranishi, Masayuki; Murakata, Chikara; Matsukuma, Ikuo; Shuto, Katsuichi; and Ichikawa, Shunji, 4,588,729, Cl. 514-263.000.

Kyrazis, Demos T., to R & D Associates. Airborne wind shear response system. 4,589,070, Cl. 364-424.000.

Kysela, Ernst; and Klauke, Erich, to Bayer Aktiengesellschaft. Process for preparing aromatic aldehydes. 4,588,844, Cl. 568-41.000.

L. & C. Steinmuller GmbH: *See*—
Pollmann, Siegfried; and Raupach, Gabriele, 4,588,568, Cl. 423-244.000.

Lablee, Jean: *See*—
Barthelemy, Pierre; and Lablee, Jean, 4,588,594, Cl. 426-36.000.

Laborde, Pedro. Financial futures game. 4,588,192, Cl. 273-240.000.

Lachmann, Burkhard: *See*—
Scholl, Thomas; Preuss, Reinhard; Lachmann, Burkhard; Lower, Hartmut; and Muller, Peter R., 4,588,807, Cl. 528-272.000.

Laffitte, David S.; Hopkins, William D.; and Hayn, John W., II, to Texas Instruments Incorporated. Solid slice memory. 4,589,099, Cl. 365-230.000.

Laganis, Evan D.: *See*—
Dicker, Ira B.; Farnham, William B.; Hertler, Walter R.; Laganis, Evan D.; Sogah, Dotsevi Y.; Del Pesco, Thomas W.; and Fitzgerald, Patrick H., 4,588,795, Cl. 526-192.000.

Lahm, Heinrich, to Index-Werke KG Hahn & Tessky. NC turret lathe. 4,587,871, Cl. 82-2.00R.

Laiteries Hubert Triballat: *See*—
Caille, Michel, 4,588,597, Cl. 426-297.000.

Lam, Jack F.; and Schmid, Hermann, to General Electric Company. Fault tolerant, frame synchronization for multiple processor systems. 4,589,066, Cl. 364-200.000.

Landau, David: *See*—
Tonon, Thomas; Bruno, Claudio; and Leshner, Michael D., 4,588,373, Cl. 431-328.000.

Lang, Gerard; Malaval, Alain; and Malle, Gerard, to L'Oreal. Sulphonamides derived from 3-benzylidene-camphor and their application as UV filters. 4,588,839, Cl. 564-84.000.

Lange, Arno; and Wuerzer, Bruno, to BASF Aktiengesellschaft. Substituted ureas and their use for controlling undesirable plant growth. 4,588,434, Cl. 71-100.000.

Lange, Barry C.; and Szapacs, Edward M., to Rohm and Haas Company. Process for the preparation of 3'-halodiphenylethers. 4,588,487, Cl. 204-157.820.

Lange, Francois: *See*—
Rascle, Roger; and Lange, Francois, 4,588,369, Cl. 425-437.000.

Lange International S.A.: *See*—
Courvoisier, Guy; and Arieh, Simon, 4,587,747, Cl. 36-117.000.

Lange, Werner: *See*—
Bohmer, Branislav; Lange, Werner; and Hohl, Frank, 4,588,772, Cl. 525-54.230.

Langer, Salomon Z.: *See*—
Cavero, Icilio; and Langer, Salomon Z., 4,588,747, Cl. 514-630.000.

Langford, Francis L., Jr.: *See*—
Impink, Albert J., Jr.; and Langford, Francis L., Jr., 4,588,547, Cl. 376-254.000.

Langner, Carl G., to Shell Oil Company. Subsea pipeline connection. 4,588,326, Cl. 405-169.000.

Lantzsch, Reinhard: *See*—
Baasner, Bernd; Klauke, Erich; and Lantzsch, Reinhard, 4,588,837, Cl. 562-605.000.

Lapeyre, Didier. Total cardiac prosthesis. 4,588,404, Cl. 623-3.000.

Larkin, John M., to Texaco Inc. Process for carbonylation of olefins to carboxylic acids and esters. 4,588,834, Cl. 560-233.000.

Larson, Duane. Air scoop mounted on snow plow. 4,587,750, Cl. 37-241.000.

Lau, Chi K.: *See*—
Haken, Roger A.; Alperin, Michael E.; and Lau, Chi K., 4,587,718, Cl. 29-571.000.

Lauchenauer, Alfred E., to Adnovum AG. Psuedoplastic gel transfer. 4,588,614, Cl. 427-243.000.

Lavallee, Francois A., to Essex Group, Inc. Aromatic titanate modified nylon magnet wire insulation coating. 4,588,784, Cl. 525-419.000.

Lay nee Konya, Aranka: *See*—
Budai, Zoltan; Kis-Tamas, Attila; Lay nee Konya, Aranka; Vig, Zoltan; Andriska, Viktor; and Mezei, Tibor, 4,588,435, Cl. 71-103.000.

LeBaron, Chester F. Linear motion damper. 4,588,054, Cl. 188-280.000.

Lebaron, Richard; and Dumoulin, Gilles. Baggage device for motorcycles and the like. 4,588,114, Cl. 224-32.00A.

Leblanc, Andre : *See*—
Le Dinh, Chon T.; and Leblanc, Andre , 4,589,083, Cl. 364-724.000.

Ledenyi, Joseph. Partition shield for automobile interior. 4,588,223, Cl. 296-24.00R.

Le Dinh, Chon T.; and Leblanc, Andre , to Centre de Recherche Industrielle du Quebec. Adaptive sinusoidal interference filter. 4,589,083, Cl. 364-724.000.

Lee C. Moore Corporation: *See*—
Woolslayer, Homer J.; and Jenkins, Cecil, 4,587,778, Cl. 52-116.000.

Lee, Eun S.: *See*—
Gale, Robert M.; Goetz, Victor; Lee, Eun S.; Taskovich, Lina T.; and Yum, Su I., 4,588,580, Cl. 424-21.000.

Lee, Gim F., Jr., to General Electric Company. Compositions of polyphenylene ether resin and diphosphites. 4,588,764, Cl. 524-128.000.

Lee, Henry J., to Florida Agricultural and Mechanical University. Anti-inflammatory prednisolone steroids. 4,588,530, Cl. 260-397.450.

Lee, Sylvia L.: *See*—
Bertschy, John R.; Cameron, T. Jay; Deckert, Kenneth L.; and Lee, Sylvia L., 4,589,036, Cl. 360-75.000.

Legg, Ernest L.: *See*—
Federico, Anthony M.; Kaisen, Kenneth R.; and Legg, Ernest L., 4,588,284, Cl. 355-14.00R.
Ippolito, Ronald A.; and Legg, Ernest L., 4,589,093, Cl. 364-900.000.

Legrand, Jean-Claude: *See*—
Chavy, Pierre P. R.; and Legrand, Jean-Claude, 4,587,784, Cl. 52-304.000.

Le Guet, Pierre-Loic: *See*—
Giovachini, Jean-Luc; Varnier, Jean-Paul; Dern, Jean-Claude; Le Guet, Pierre-Loic; and Pascal, Jean-Pierre, 4,587,841, Cl. 73-148.000.

Lehtolahti, Raimo: *See*—
Ikonen, Alpo; Lehtolahti, Raimo; and Mustalampi, Reino, 4,587,687, Cl. 15-314.000.

Leibinger, Franz: *See*—
Leibinger, Karl; and Leibinger, Franz, 4,587,963, Cl. 128-92.00B.

Leibinger, Karl; and Leibinger, Franz. Instrument for positioning a cerclage fixation device around fractured bone parts. 4,587,963, Cl. 128-92.00B.

Leier, Wolfgang: *See*—
Berges, Hanns-Peter; and Leier, Wolfgang, 4,588,504, Cl. 210-234.000.

Leland Stanford Junior University, The Board of Trustees of the: *See*—
Barth, Phillip W., 4,587,719, Cl. 29-577.00C.
Tur, Moshe; Goodman, Joseph W.; Shaw, Herbert J.; Moslehi, Behzad; and Bowers, John E., 4,588,255, Cl. 350-96.160.

Lemelson, Jerome H. Catheter and method. 4,588,395, Cl. 604-59.000.

Le Merer, Jean P.: *See*—
Volleau, Patrick; Bricot, Claude; Audouin, Michel; Leterme, Dominique; and Le Merer, Jean P., 4,589,102, Cl. 369-46.000.

Lemoine, Austin J.: *See*—
Coombes, Graham E.; and Lemoine, Austin J., 4,587,859, Cl. 74-2.000.

Lentz, David J.: *See*—
Daugherty, Charles W.; Khan, Mohammad A.; Lentz, David J.; and Thoresen, Stephen L., 4,588,398, Cl. 604-265.000.

Leonard, Emil T.; and Draney, Robert G., to J. I. Case Company. Vibratory plow blade. 4,588,034, Cl. 172-40.000.

Leonard, George E., to Kartridg Pak Co., The. Rotary filling apparatus and method. 4,588,001, Cl. 141-5.000.

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Tonon, Thomas; Bruno, Claudio; and Leshner, Michael D., 4,588,373, Cl. 431-328.000.

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Levasseur, Joseph L.; and Hoorman, Ronald A., to H. R. Electronics Company. Coin tube monitor means. 4,587,984, Cl. 133-8.00R.

Lever Brothers Company: *See*—
Jones, Frank; Reed, David A.; Crompton, Jane A.; and Beramendi, Pedro M., 4,588,514, Cl. 252-98.000.
Motarjemi, Minoo, 4,588,582, Cl. 424-49.000.

Levine, Alfred B. Multiplexed photocopier system with portable scanner. 4,588,282, Cl. 355-3.00R.

Levrai, Roland: *See*—
Carre, Jean-Jacques; and Levrai, Roland, 4,588,363, Cl. 418-201.000.

Levy, Jean-Paul: *See*—
Bunel, Gerard; Levy, Jean-Paul; and Martinez, Christian, 4,588,621, Cl. 428-35.000.

Lewis, Roger E.; and Hayes, Webb W., Jr., to Earl & Wright. Retractable closure for roof opening. 4,587,775, Cl. 52-65.000.

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Berges, Hanns-Peter; and Leier, Wolfgang, 4,588,504, Cl. 210-234.000.

Leyden, Richard N.; and Hall, James T. Process for the photochemical vapor deposition of aromatic polymers. 4,588,609, Cl. 427-54.100.

Liakus, Sandra J.: *See*—
Wolff, James W.; and Liakus, Sandra J., 4,587,912, Cl. 112-256.000.

Liau, Shung-Chung; Tseng, Kuo-Shu; and Huang, Yen H., to Formosa Plastics Corporation. Process for reducing polymer buildup. 4,588,613, Cl. 427-230.000.

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Liebermann, Howard H., to Allied Corporation. Casting in an exothermic reducing flame atmosphere. 4,588,015, Cl. 164-463.000.

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Pejas, Wolfram; Liehmann, Jorg; and Brauch, Ulrich, 4,588,881, Cl. 235-385.000.

Lifecare Services, Inc.: *See*—
Chu, Raymond D.; Rubner, Anthony C.; and Bergman, Marc A., 4,587,967, Cl. 128-204.210.

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Kauffman, William J.; and Lilley, George L., 4,588,545, Cl. 264-46.400.

Lin, Juei J. Precast concrete pile and method of placing it in the ground. 4,588,327, Cl. 405-244.000.

Lin, Leo S.: *See*—
Mark, David F.; Lin, Leo S.; and Yu Lu, Shi-Da, 4,588,585, Cl. 424-85.000.

Lin, Paul S., to AT&T Bell Laboratories. Method for measuring current at a p-n junction. 4,588,946, Cl. 324-158.00D.

Lind, Michael A.; and Dunn, Michael R., to New Draulics, Inc. Cable cutting and crimping. 4,587,732, Cl. 30-92.000.

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Lindberg, Terrance D., to Minnesota Mining and Manufacturing Company. Head-cleaning diskette having jacket with removable tab. 4,589,044, Cl. 360-128.000.

Lindemann Maschinenfabrik GmbH: *See*—
Kaldenbach, Erwin, 4,588,003, Cl. 141-71.000.

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Lindsey, Thomas J., Jr., to Lockheed Corporation. Method and apparatus for securing payloads to the exterior of an aircraft. 4,588,147, Cl. 244-118.100.

Lindstrom, Kjell O. T.: *See*—
Augustsson, Nils E.; Lindstrom, Kjell O. T.; and Mattsson, Lars J. S., 4,589,126, Cl. 378-209.000.

Linear Technology Corporation: *See*—
Khadder, Wadie N.; and Wang, Jia-Tarng, 4,588,454, Cl. 148-188.000.

Lines, Jennifer. Apparatus for winding fishing line onto a fishing reel. 4,588,139, Cl. 242-84.10M.

Link, Helmut F.; and Grossmann, Walter, to Index Werke Komm. Ges. Hahn & Tessky. Automatic turret lathe. 4,587,697, Cl. 29-27.00C.

Link, William T., to Norse Instruments. Linear pressurizing and depressurizing device. 4,587,974, Cl. 128-685.000.

Links, Gordon R.; and Ellisor, Alvin L. Sewer drain securing device for use with recreational vehicles. 4,587,994, Cl. 138-89.000.

Liposome Company, Inc., The: *See*—
Fountain, Michael W.; Weiss, Steven J.; and Popescu, Mircea C., 4,588,578, Cl. 424-1.100.

Lirette, Hewitt P. Fishing device. 4,587,757, Cl. 43-21.200.

Lis, Robert J., to General Motors Corporation. End turn insulation for a dynamoelectric machine. 4,588,916, Cl. 310-260.000.

Lisiecki, Robert E., to Ex-Cell-O Corporation. In-folded fin seal end closure. 4,588,122, Cl. 229-17.00R.

Litman, Alan, to Smith & Wesson Chemical Company, Inc. Holster for a chemical tear gas projector. 4,588,116, Cl. 224-253.000.

Little, Darlan R. Arrow support, sight and guide. 4,587,945, Cl. 124-87.000.

Littlejohn, Duane P.: *See*—
Ghaderi, Sahba; Shohet, Juda L.; and Littlejohn, Duane P., 4,588,888, Cl. 250-291.000.

Liu, Nan-I, to General Electric Company. Low modulus structural foam. 4,588,754, Cl. 521-92.000.

Liu, Ruichen; and Thomson, Michael G. R., to AT&T Bell Laboratories. Electron emission system. 4,588,928, Cl. 315-382.000.

Lockheed Corporation: *See*—
Khurana, Sudershan K., 4,588,334, Cl. 408-61.000.
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Loffer, Bill: *See*—
Drake, Charles A.; and Loffer, Bill, 4,588,704, Cl. 502-111.000.

Loire, Rene M. A.; and Pagezy, Michel J. E., to Loire, Renee M. A.; and Tramco S.A. Simplified single device for mooring and loading-unloading tanker vessels from a submarine conduit for feeding or

discharging a fluid, and method of installing said submarine conduit and said simplified mooring device. 4,587,919, Cl. 114-230.000.

Loire, Renee M. A.: *See—*
Loire, Rene M. A.; and Pagezy, Michel J. E., 4,587,919, Cl. 114-230.000.

Loizeau, Pierre: *See—*
Caray, Andree ; and Loizeau, Pierre, 4,588,062, Cl. 192-106.200.

Long, Eric L.: *See—*
Bailey, James R.; and Long, Eric L., 4,588,854, Cl. 174-52.00R.

Long Mile Rubber Co., Inc.: *See—*
Magee, Arthur W.; Shockley, Richard D.; and Crawford, Michael E., 4,588,460, Cl. 156-96.000.

L'Oreal: *See—*
Lang, Gerard; Malaval, Alain; and Malle, Gerard, 4,588,839, Cl. 564-84.000.

Lorenz, Kurt: *See—*
Weber, Heinrich; Lorenz, Kurt; and Dungs, Horst, 4,588,479, Cl. 202-228.000.

Lorthioir, Gerard: *See—*
Cohen, Joseph; and Lorthioir, Gerard, 4,588,485, Cl. 204-64.00R.

Loughlin, Bernard D., to Hazeltine Corporation. Independent sideband AM multiphonic system. 4,589,127, Cl. 381-16.000.

Love, Jerry A.: *See—*
Love, Larry W.; Gray, Raymond G., Sr.; and Love, Jerry A., 4,587,678, Cl. 4-251.000.

Love, Larry W.; Gray, Raymond G., Sr.; and Love, Jerry A. Toilet seat booster. 4,587,678, Cl. 4-251.000.

Lovisolo, Pier P.: *See—*
Cozzi, Paolo; Pilian, Antonio; and Lovisolo, Pier P., 4,588,738, Cl. 514-399.000.

Lovoi, Paul A.; and Frank, Alan M., to International Technical Associates. Method of and apparatus for the removal of paint and the like from a substrate. 4,588,885, Cl. 250-226.000.

Lower, Hartmut: *See—*
Scholl, Thomas; Preuss, Reinhard; Lachmann, Burkhard; Lower, Hartmut; and Muller, Peter R., 4,588,807, Cl. 528-272.000.

Ludwig, Gerhard: *See—*
Spuck, Gisbert; and Ludwig, Gerhard, 4,588,090, Cl. 206-532.000.

Lulay, Lawrence O.; and Nichols, Steven F., to C & H Printing, Inc. Method of manufacture of printing plates from prepared copy. 4,588,291, Cl. 355-77.000.

Lumsden, Robert D.; and Sasser, Myron, to United States of America, Agriculture. Medium for the isolation of *Pseudomonas cepacia* biotype from soil and the isolated biotype. 4,588,584, Cl. 424-93.000.

Lundstrom, Kristian, to Tamfelt Oy AB. Method and device for reducing the rewetting of web material after a press nip. 4,588,475, Cl. 162-205.000.

Lunquist, Frank C.: *See—*
Moechnig, Carl; and Lunquist, Frank C., 4,588,092, Cl. 209-573.000.

Lupke, Gerd P. H.: *See—*
Lupke, Manfred A. A.; and Lupke, Gerd P. H., 4,587,874, Cl. 83-340.000.

Lupke, Manfred A. A.; and Lupke, Gerd P. H. Rotary punch. 4,587,874, Cl. 83-340.000.

Lurssen, Klaus: *See—*
Schmitt, Hans-Georg; Lurssen, Klaus; and Wedemeyer, Karlfried, 4,588,433, Cl. 71-98.000.

Lutz, Hans. Liquid surface heating system for floors. 4,588,125, Cl. 237-69.000.

Luursema, Meerten; and Palmers, Hilbert, to U.S. Philips Corporation. High efficiency converter for discharge lamps. 4,588,924, Cl. 315-107.000.

Lyons, Harold W.: *See—*
Ferenc, Robert A.; and Lyons, Harold W., 4,588,118, Cl. 224-331.000.

M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See—*
Sukarie, George, 4,588,622, Cl. 428-35.000.

M.A.N.-Roland Druckmaschinen Aktiengesellschaft: *See—*
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Theilacker, Klaus, 4,587,899, Cl. 101-365.000.

M&T Chemicals Inc.: *See—*
Chessin, Hyman; and Newby, Kenneth R., 4,588,481, Cl. 204-51.000.

Mack, William; and Matison, Gary G., to Clairol Incorporated. Heat pack apparatus. 4,587,950, Cl. 126-263.000.

Maclay, William R.; and Hewett, William A., to Pentalux Corporation. Timer control for television. 4,588,901, Cl. 307-141.000.

Madden, William M., to United Technologies Corporation. Area two-dimensional converging/diverging nozzle. 4,587,806, Cl. 60-271.000.

Madderra, Jimmy M.: *See—*
Schaeffel, John A., Jr.; Madderra, Jimmy M.; and West, Ronald L., 4,588,146, Cl. 244-3.270.

Maddock, Robert T., to Mobil Oil Corporation. Method of forming a thermoplastic film sack having a stress relieved bottom gusset seal line. 4,588,392, Cl. 493-200.000.

Mader, Klaus, to Mader, Reinhard, a part interest. Hawaii trapeze spreader bar. 4,588,044, Cl. 182-3.000.

Mader, Reinhard: *See—*
Mader, Klaus, 4,588,044, Cl. 182-3.000.

Madnick, Herman; and Goldman, Ralph F., to Multi-Tech Corporation. Cold-weather hand covering having selectively shaped chemical heating element receiving chamber. 4,587,672, Cl. 2-158.000.

Maeda, Makoto: *See—*
Sumiyoshi, Hiroji; Maeda, Makoto; and Aoki, Takashi, 4,588,430, Cl. 65-56.000.

Magdics, Alex: *See—*
Worthington, Ralph E.; Magdics, Alex; and Stain, Donald B., 4,588,573, Cl. 423-552.000.

Magee, Arthur W.; Shockley, Richard D.; and Crawford, Michael E., to Long Mile Rubber Co., Inc. Method and apparatus for recapping a tire with a flexible segmented mold. 4,588,460, Cl. 156-96.000.

Magee, Robert D.; Asztalos, Michael J.; and Trinh, Vuong D., to Westinghouse Electric Corp. Pressurizer passive steam relief and quench spray system. 4,588,548, Cl. 376-307.000.

Mager, Herbert: *See—*
Konrad, Eugen; Braun, Hans-Jurgen; and Mager, Herbert, 4,588,410, Cl. 8-421.000.

Magerlein, Barney J.; and Whaley, Howard A., to Upjohn Company, The. Antibiotic nodusmicins. 4,588,817, Cl. 548-125.000.

Magnetic Peripherals Inc.: *See—*
Shadzi, Bahram, 4,588,611, Cl. 427-129.000.

Mahan, Donald R., to Upjohn Company, The. Treatment of negative symptoms of schizophrenia. 4,588,721, Cl. 514-220.000.

Mahoney, Kenneth J.; Rosenburg, Dana G.; and Mahoney, Thomas H. Backboard reinforcing apparatus. 4,588,188, Cl. 273-1.50R.

Mahoney, Thomas H.: *See—*
Mahoney, Kenneth J.; Rosenburg, Dana G.; and Mahoney, Thomas H., 4,588,188, Cl. 273-1.50R.

Maiden, Charles W.; Conroy, Ernest F., Jr.; and Dorman, John G., to Westinghouse Electric Corp. Escalator with controlled brake. 4,588,065, Cl. 198-323.000.

Mailliet, Pierre; Bernard, Gilbert; and Calmes, Marc, to Paul Wurth S.A. Device for regulating the delivery of hot air in a tuyere stock of a shaft furnace and a tuyere stock which incorporates the same. 4,588,168, Cl. 266-81.000.

Mair, Alexander D.; and Soroczak, Myra M., to Tennessee Valley Authority. Single float step phosphate ore beneficiation. 4,588,498, Cl. 209-9.000.

Maki, Nagatoshi. Wad and slug for a shotgun cartridge. 4,587,905, Cl. 102-430.000.

Makino, Takao, to Kabushiki Kaisha Morita Seisakusho. Dental panoramic X-ray photographing apparatus. 4,589,121, Cl. 378-39.000.

Malakhow, Walter: *See—*
Rossi, Alfred F.; Johns, Albert D.; Malakhow, Walter; and Michalec, George W., 4,588,539, Cl. 264-40.500.

Malaval, Alain: *See—*
Lang, Gerard; Malaval, Alain; and Malle, Gerard, 4,588,839, Cl. 564-84.000.

Malhi, Satwinder D.: *See—*
Salama, Clement A.; and Malhi, Satwinder D., 4,588,960, Cl. 330-264.000.

Malin, John D.; and Porucznik, Paul, to Metal Box public limited company. Method and apparatus for metering and dispensing volatile liquids. 4,588,000, Cl. 141-1.000.

Malle, Gerard: *See—*
Lang, Gerard; Malaval, Alain; and Malle, Gerard, 4,588,839, Cl. 564-84.000.

Mallet, Bernard, to Valeo. Clutch release bearing assembly, coupling member for same and installation and removal methods for same. 4,588,061, Cl. 192-98.000.

Malmqvist, Erik L.; and Kristiansson, Krister, to Boliden Aktiebolag. Method for indicating concealed deposits. 4,587,847, Cl. 73-432.00R.

Maloney, David L.: *See—*
Liautaud, James P.; Stultz, Peter F.; and Maloney, David L., 4,588,938, Cl. 320-2.000.

Malzacher, Fred H. Cable spooling system. 4,588,142, Cl. 242-86.50R.

Mammato, Donald C.: *See—*
Kelly, Michael; Mammato, Donald C.; Durham, Dana; Jain, Sangya; and Crane, Lawrence, 4,588,670, Cl. 430-165.000.

Mammoser, Joseph G.: *See—*
Trenary, John M.; and Mammoser, Joseph G., 4,588,130, Cl. 239-381.000.

Manchem Limited: *See—*
Tate, Philip E. R., 4,588,766, Cl. 524-176.000.

Manis, Paul A.; Martin, Eugene R.; and Muntz, Ronald L., to SWS Silicones Corporation. Stabilized thiofunctional polysiloxane fluids and a process for stabilizing the same. 4,588,771, Cl. 524-731.000.

Mannesmann Rexroth GmbH: *See—*
Schulte, Heinz, 4,587,988, Cl. 137-110.000.

Mansfield, Peter. Nuclear magnetic resonance methods. 4,588,948, Cl. 324-309.000.

Mansouri, Mansour N.; Mansouri, Masoud N.; and Imani, Kambiz. Power operated separable beds and support therefor. 4,587,681, Cl. 5-8.000.

Mansouri, Masoud N.: *See—*
Mansouri, Mansour N.; Mansouri, Masoud N.; and Imani, Kambiz, 4,587,681, Cl. 5-8.000.

Manville Sales Corporation: *See—*
Vehmas, Olavi E.; Kotyuk, Bernard L.; and Pallo, John M., 4,588,769, Cl. 524-448.000.

Maranto, Jack J., to Hughes Aircraft Company. Separable splice for optic fibers. 4,588,257, Cl. 350-96.210.

Marchitto, Michael J.: *See—*
Ferris, Donald L.; and Marchitto, Michael J., 4,588,355, Cl. 416-114.000.

Marcinek, John A., to Emhart Industries, Inc. Parison for making molecularly oriented plastic bottles. 4,588,620, Cl. 428-35.000.

Marder, Herbert B. Apparatus and method for dispensing medicine. 4,588,237, Cl. 312-209.000.

Maresca, Robert L.: *See*—
Stolfi, Fred R.; Maresca, Robert L.; and Adamovic, Peter P., 4,587,971, Cl. 128-660.000.

Mark, David F.; Lin, Leo S.; and Yu Lu, Shi-Da, to Cetus Corporation. Human recombinant cysteine depleted interferon-β muteins. 4,588,585, Cl. 424-85.000.

Markstein, Peter W.: *See*—
Auslander, Marc A.; Cocke, John; Hao, Hsieh T.; Markstein, Peter W.; and Radin, George, 4,589,065, Cl. 364-200.000.
Auslander, Marc A.; Cocke, John; Hao, Hsieh T.; Markstein, Peter W.; and Radin, George, 4,589,087, Cl. 364-768.000.

Marlett, Everett M., to Ethyl Corporation. Synthesis of (alkoxyalkyl) amines. 4,588,843, Cl. 564-508.000.

Marriage, David J.: *See*—
Ullman, Thomas J.; Shadbolt, Colin F.; Pagdin, Brian C.; Marriage, David J.; Clarke, Peter J.; and Sheppard, Ian J., 4,587,986, Cl. 137-1.000.

Marshall, Larry D.; and Moore, Marvin F., to Thermalloy Incorporated. Heat sink and method of manufacture. 4,588,028, Cl. 165-185.000.

Martel, Lisa: *See*—
Weiss, Merkel F.; Parrott, Joel C.; and Martel, Lisa, 4,588,403, Cl. 604-411.000.

Martin, David O.; and Martin, Lawrence G., to Martin Door Manufacturing. Torsion spring apparatus and method. 4,588,175, Cl. 267-155.000.

Martin, Donald L., to United States of America, Army. Rocket extraction device. 4,588,222, Cl. 294-16.000.

Martin Door Manufacturing: *See*—
Martin, David O.; and Martin, Lawrence G., 4,588,175, Cl. 267-155.000.

Martin, Eugene R.: *See*—
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Martin, Lawrence G.: *See*—
Martin, David O.; and Martin, Lawrence G., 4,588,175, Cl. 267-155.000.

Martin, Pascal: *See*—
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Martinez, Christian: *See*—
Bunel, Gerard; Levy, Jean-Paul; and Martinez, Christian, 4,588,621, Cl. 428-35.000.

Martis, Ronald J. J.: *See*—
Nathasingh, Davidson M.; Datta, Amitava; Martis, Ronald J. J.; and DeCristofaro, Nicholas J., 4,588,452, Cl. 148-108.000.

Maruyama, Tsutomu; Ikoma, Mitugi; and Satoh, Kiyoe, to Kibun Company Limited. Method of producing paste product like lobster's meat. 4,588,601, Cl. 426-574.000.

Masakazu, Miyoshi: *See*—
Matsui, Tatsuhiko; Aida, Hiroyuki; Watanabe, Akira; and Masakazu, Miyoshi, 4,588,220, Cl. 292-338.000.

Maschinenfabrik Augsburg-Nurnberg: *See*—
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Maschinenfabrik Sulzer-Ruti AG: *See*—
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Maskevitch, James A.: *See*—
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Maskinverkstaden Jordan Knez: *See*—
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Mason, Anthony J.; May, Geoffrey J.; and Turner, Michael, to Tungstone Batteries Limited. Level-acid battery having an improved terminal pillar to battery lid seal. 4,588,663, Cl. 429-54.000.

Massa, Ronald J.; Ellis, Theodore R.; and LePage, Robert G., to Dynatrend, Incorporated. Intelligent surveillance alarm system and method. 4,589,081, Cl. 364-554.000.

Massey-Ferguson Services N.V.: *See*—
Bailey, Alfred J., 4,587,909, Cl. 111-67.000.

Masterov, Vyacheslav N.: *See*—
Fedorov, Svyatoslav N.; Egorova, Eleonora V.; Spiridonov, Oleg P.; Nanushian, Sergei R.; Benenson, Igor L.; Degtev, Evgeny I.; Masterov, Vyacheslav N.; and Kiselev, Vladimir G., 4,588,406, Cl. 623-6.000.

Masuda, Ikuro: *See*—
Kuboki, Shigeo; Ikeda, Mitsuhiro; Takano, Akihiko; Nishio, Yoji; and Masuda, Ikuro, 4,589,007, Cl. 357-45.000.

Masuda, Naosuke; and Sonoda, Hirotetsu, to Jidosha Kiki Co., Ltd. Power steering device. 4,587,886, Cl. 91-415.000.

Masuda, Yutaka, to Yamaha Hatsudoki Kabushiki Kaisha. Automatic speed control system for motorcycles. 4,587,937, Cl. 123-349.000.

Matarese, Alfred P.; and Bosshart, George S., to United Technologies Corporation. Method of applying continuously graded metallic-ceramic layer on metallic substrates. 4,588,607, Cl. 427-34.000.

Mathison, Allen D.: *See*—
Nelson, Dale K.; and Mathison, Allen D., 4,588,110, Cl. 222-135.000.

Matick, Richard E., to International Business Machines Corporation. Data buffer having separate lock bit storage array. 4,589,092, Cl. 364-900.000.

Matison, Gary G.: *See*—
Mack, William; and Matison, Gary G., 4,587,950, Cl. 126-263.000.

Matlach, William J., to Petrolite Corporation. Particulate compositions. 4,588,640, Cl. 428-407.000.

MATRA: *See*—
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Matsubara, Hiromi: *See*—
Nishida, Yoshinori; Imai, Tsunemichi; and Matsubara, Hiromi, 4,587,707, Cl. 29-527.700.

Matsuda, Akira: *See*—
Oda, Hidekuni; Murata, Kazuhiko; Kajiura, Hirokazu; and Matsuda, Akira, 4,588,794, Cl. 526-169.200.

Matsuda, Hajime; and Morito, Hiroshi, to NEC Corporation. Charge transfer device having improved electrodes. 4,589,005, Cl. 357-24.000.

Matsui, Satoshi, to Hitachi Seiko, Ltd. Method of an apparatus for grinding work surface. 4,587,765, Cl. 51-56.00R.

Matsui, Tatsuhiko; Aida, Hiroyuki; Watanabe, Akira; and Masakazu, Miyoshi, to Nissan Motor Company, Limited; and Kato Hatsujo Kaisha, Ltd. Structure for removably mounting support rod for openable closure member of motor vehicle. 4,588,220, Cl. 292-338.000.

Matsukuma, Ikuo: *See*—
Teranishi, Masayuki; Murakata, Chikara; Matsukuma, Ikuo; Shuto, Katsuichi; and Ichikawa, Shunji, 4,588,729, Cl. 514-263.000.

Matsumoto, Kazuya: *See*—
Nakamura, Tsutomu; and Matsumoto, Kazuya, 4,589,027, Cl. 358-213.000.

Matsumoto, Kou; Oota, Toshio; Asaka, Yugi; and Nakamura, Mitsuki, to Honda Giken Kogyo Kabushiki Kaisha. Rough forging mold and finish forging mold. 4,587,828, Cl. 72-356.000.

Matsumoto, Kunio; Kagimoto, Yoshitaka; Hirata, Tsutomu; Watanabe, Susumu; Ohtsuka, Akira; and Takahashi, Kiyoharu, to Toyo Jozo Kabushiki Kaisha; and Kokusan Chemical Works Limited. Novel synthetic substrate and assay method using the same. 4,588,836, Cl. 562-448.000.

Matsumoto, Motoki: *See*—
Nakamura, Kazuharu; Matsumoto, Motoki; Yoshino, Tooru; and Niha, Osamu, 4,588,371, Cl. 431-14.000.

Matsumoto, Takahiro: *See*—
Harumoto, Yoshinobu; Yoshida, Yoshio; Kabayama, Yuichi; Kan, Hisao; Hakata, Tetsuro; and Matsumoto, Takahiro, 4,588,972, Cl. 336-58.000.

Matsumura, Hiroshi: *See*—
Endo, Keizo; Matsumura, Hiroshi; Shimamura, Norio; and Kawabe, Masaru, 4,589,069, Cl. 364-405.000.

Matsuoka, Mamoru, to Japan Atomic Energy Research Institute. Arc discharge abnormality detecting system. 4,588,952, Cl. 324-409.000.

Matsushima, Yuichi: *See*—
Utaka, Katsuyuki; Sakai, Kazuo; Akiba, Shigeyuki; and Matsushima, Yuichi, 4,589,117, Cl. 372-50.000.

Matsushita Electronics Corporation: *See*—
Tateno, Kenichi; Yokozawa, Masami; Fujii, Hiroyuki; Nishikawa, Mikio; Katoh, Michio; and Wada, Fujio, 4,589,010, Cl. 357-70.000.

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Pearlman, Jay S.; Riordan, John C.; and Valencia, Vance I., 4,589,123, Cl. 378-106.000.

Maxwell, Peter C., to Celanese Corporation. Process for the production of muconic acid. 4,588,688, Cl. 435-142.000.

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Mason, Anthony J.; May, Geoffrey J.; and Turner, Michael, 4,588,663, Cl. 429-54.000.

Mayhew, John D., Jr. Turn disc slide valve. 4,587,989, Cl. 137-375.000.

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Mazin, Moshe: *See*—
Stewart, Roger G.; and Mazin, Moshe, 4,589,008, Cl. 357-45.000.

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Byrd, Norman R., 4,588,838, Cl. 564-14.000.
Cahill, Richard F.; and Udd, Eric, 4,588,296, Cl. 356-350.000.
Speakman, Eugene R., 4,587,833, Cl. 72-465.000.

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Strong, David W.; McGinnis, Patricia A.; Peterson, James D.; Ballmer, Steven A.; Raburn, Vern L.; Hall, Dorothy L.; and Fleck, David A., 4,588,074, Cl. 206-45.150.

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McHugh, John E. Method of forming an aqueous solution of 3-3-Bis(p-hydroxyphenyl)-phthalide. 4,588,744, Cl. 514-470.000.

McKinney, Craig W.: *See—*
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McMahon, Paul E.: *See—*
Chung, Tai-Shung; Furst, Howard; Gurion, Zev; McMahon, Paul E.; Orwoll, Richard D.; and Palangio, Daniel, 4,588,538, Cl. 264-29.200.

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Mead Corporation, The: *See—*
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Gengler, Jeffrey R., 4,587,955, Cl. 128-1.00R.

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Melville, Andreas T.: *See—*
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Melzi, Carlo; and Gregorutti, Paolo, to Acciaierie Weissenfels S.p.A. Anti-skid device for motor vehicle tires. 4,588,010, Cl. 152-213.00A.

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Mendoza, Abel, to Dow Chemical Company, The. Preparation of (2-(6-substituted)-pyridinyloxy)alkanols from 2-(6-substituted)-pyridinols and organic carbonates. 4,588,816, Cl. 546-301.000.

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Burkhart, Joseph P.; and Holbert, Gene W., 4,588,825, Cl. 549-475.000.

Mery, Jean-Claude, to Societe Anonyme D.B.A. Disc brake. 4,588,051, Cl. 188-73.320.

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Mickelson, N. Peter; and Napiorkowski, John J., to GTE Products Corporation. Telephone network interface connector. 4,588,238, Cl. 339-91.00R.

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Miki, Nobuaki; Nakamura, Shinya; and Shibata, Kazuhiko, to Aisin-Warner Kabushiki Kaisha. Lock-up clutch control system for automatic transmissions. 4,588,059, Cl. 192-3.280.

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Miller, George R., to Roman Arch and Culvert Corporation of America. Precast concrete bridge. 4,587,684, Cl. 14-24.000.

Miller, Harry B., to United States of America, Navy. Electronic noise-reducing system. 4,589,137, Cl. 381-94.000.
Miller, Larry D., to General Motors Corporation. Centrifugal-type air blower bleed-off arrangement. 4,588,351, Cl. 415-47.000.
Miller, Ralph. Recovery of concentrated H_2S from SO_2 contained in flue gas. 4,588,567, Cl. 423-242.000.
Miller, William H., to General Electric Company. Method of making a dynamoelectric machine stator supporting structure. 4,587,722, Cl. 29-596.000.
Mills, Charles E. Punch press with quick-change die set. 4,587,830, Cl. 72-442.000.
Mills, Derek J., to Metpost Limited. Post support. 4,588,157, Cl. 248-545.000.
Milner, Ronald E.; and Bushnell, Nolan K., to Axlon, Incorporated. Method and apparatus for voice emulation. 4,589,138, Cl. 381-110.000.
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Onstott, James R.; Cronk, Bryon J.; and Cherney, Thomas M., 4,588,256, Cl. 350-96.210.
Paciorek, Walter J., 4,588,465, Cl. 156-220.000.
Palensky, Frederick J.; and Siedle, Allen R., 4,588,800, Cl. 528-15.000.
Minnis, Ralph L.; Moschovis, Elias P.; and Killeen, James J., to DeSoto, Inc. Aqueous emulsion laminating adhesive. 4,588,757, Cl. 523-406.000.
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Mitsubishi Chemical Industries, Ltd.: *See*—
Kaneko, Masaharu; Yoneyama, Tomio; Iwanami, Junko; Imazeki, Shuji; Mukoh, Akio; and Sato, Mikio, 4,588,517, Cl. 252-299.100.
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Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
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Miyachi, Chihiro, to Howa Kogyo Kabushiki Kaisha; and Kabushiki Kaisha Yamazaki Tekkosho. Chuck jaw changer for a machine tool. 4,587,708, Cl. 29-568.000.
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Kam, Anthony Y.; Krambeck, Frederick J.; and Schatz, Klaus W., 4,588,558, Cl. 422-113.000.
Maddock, Robert T., 4,588,392, Cl. 493-200.000.
Moebus, Horst, to Kolbenschmidt Aktiengesellschaft. Liquid-cooled composite piston for internal combustion engines. 4,587,932, Cl. 123-41.350.
Moechnig, Carl; and Lunquist, Frank C., to Automated Electronic Technology, Inc. Integrated circuit handling and contact system. 4,588,092, Cl. 209-573.000.
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Molodnyakov, Sergei P.; Fedorov, Jury I.; Kuznetsov, Vitaly A.; Egorochkin, Alexei N.; Birjukova, Tamara G.; and Razuvaev, Grigory A., to Institut Khimii Akademii Nauk SSSR. Photo and electron resist with donor-acceptor complex and light sensitive compound. 4,588,671, Cl. 430-191.000.
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Monahan, John F.; Hacke, Joseph F.; and Casne, Thomas F., to RCA Corporation. Dark current measurement and correction for video from field-transfer imagers. 4,589,025, Cl. 358-213.000.
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Bekker, Vladimir; Buchheim, Wayne J.; Vanderlinde, William; and Wang, Donald S. T., 4,588,776, Cl. 525-81.000.

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Moore, Marvin W., to Microdot Inc. Socket. 4,588,248, Cl. 339-94.00L.

Moores, Keith J. Variable-timing valve actuating mechanism. 4,587,934, Cl. 123-90.180.

Morales, Alfredo L.; Galiasso, Roberto; Carrasquel, Angel R.; and Salazar, Jose A., to Intevep, S.A. Catalyst for removing sulfur and metal contaminants from heavy crudes and residues. 4,588,709, Cl. 502-314.000.

Morantte, Bernardo D., Jr. Device for diagnostic and therapeutic intravascular intervention. 4,587,972, Cl. 128-660.000.

Morellet, Guy; Jacquesy, Jean-Claude; and Jouannetaud, Marie-Paule, to Atochem. Process for the preparation of aminophenols. 4,588,841, Cl. 564-443.000.

Morey, William A., to Rockwell International Corporation. Ultra low power video amplifier. 4,589,032, Cl. 358-242.000.

Mori, Fumio: *See—*
Itsubo, Junichi; Yazaki, Takashi; and Mori, Fumio, 4,588,100, Cl. 215-252.000.

Mori, Kei. Solar ray collector for spacecraft. 4,588,151, Cl. 244-173.000.

Mori, Shoichi: *See—*
Kono, Koichi; Mori, Shoichi; Miyasaka, Kenji; and Tabuchi, Jyoichi, 4,588,633, Cl. 428-220.000.

Morimoto, Eiji: *See—*
Yasuda, Shinichiro; Morimoto, Eiji; and Ueda, Yuichi, 4,588,668, Cl. 430-109.000.

Morimoto, Tomiaki: *See—*
Sawada, Takashi; Morimoto, Tomiaki; Miyoshi, Isao; Taguchi, Hirokuni; Tohmatsu, Junichi; and Kitamura, Toyohiro, 4,588,681, Cl. 435-5.000.

Morimoto, Yoshiro: *See—*
Yamamuro, Sigeaki; Abo, Keiju; Tanaka, Yoshikazu; Kumura, Haruyoshi; Hirano, Hiroyuki; and Morimoto, Yoshiro, 4,589,071, Cl. 364-424.100.

Morinaga, Masaru: *See—*
Ueda, Takeo; and Morinaga, Masaru, 4,587,696, Cl. 24-637.000.

Morinaga Milk Industry Co., Ltd.: *See—*
Okonogi, Shigeo; Kawashima, Takuji; Kudo, Tsutomu; Yuguchi, Hiroya; Hiramatsu, Akinori; Teraguchi, Susumu; and Yaeshima, Tomoko, 4,588,595, Cl. 426-43.000.

Morishita, Akira, to Mitsubishi Denki Kabushiki Kaisha. Internal speed-reduction type starter. 4,587,861, Cl. 74-7.00E.

Morita, Minoru: *See—*
Takegami, Keizo; Morita, Minoru; Nakamaru, Kazuto; and Miwa, Koji, 4,588,414, Cl. 23-295.00R.

Morito, Hiroshi: *See—*
Matsuda, Hajime; and Morito, Hiroshi, 4,589,005, Cl. 357-24.000.

Moritz, William E., III: *See—*
Aswell, James E.; and Moritz, William E., III, 4,588,561, Cl. 422-238.000.

Morley, John G., to BCIRA. Binders for foundry cores and moulds. 4,588,013, Cl. 164-16.000.

Morris, Frank I., to Memorex Corporation. Manufacture of motor with split back magnet array. 4,587,714, Cl. 29-594.000.

Morris, Paul A.: *See—*
Pagen, Charles A.; Stepien, George, Jr.; and Morris, Paul A., 4,588,634, Cl. 428-283.000.

Mortberg, Edward. High vacuum capacitance manometer having Px side open housing. 4,587,851, Cl. 73-724.000.

Moschovis, Elias P.: *See—*
Minnis, Ralph L.; Moschovis, Elias P.; and Killeen, James J., 4,588,757, Cl. 523-406.000.

Moscony, John J.; Michielutti, Thomas J.; and Wetzel, Charles M., to RCA Corporation. Photoexposing a photoresist-coated sheet in a vacuum printing frame. 4,588,676, Cl. 430-327.000.

Moser, Bernd, to Boge GmbH. Arrangement for determining the travel of a piston. 4,587,850, Cl. 73-658.000.

Moslehi, Behzad: *See—*
Tur, Moshe; Goodman, Joseph W.; Shaw, Herbert J.; Moslehi, Behzad; and Bowers, John E., 4,588,255, Cl. 350-96.160.

Motamedi, Manouchehr E., to United States of America, Army. Non-volatile piezoelectric memory transistor. 4,589,009, Cl. 357-54.000.

Motarjemi, Minoo, to Lever Brothers Company. Toothpaste with entrained gas. 4,588,582, Cl. 424-49.000.

Motoda Denshi Kogyo Kabushiki Kaisha: *See—*
Motoda, Kenro, 4,588,341, Cl. 414-32.000.

Motoda, Kenro, to Motoda Denshi Kogyo Kabushiki Kaisha. Article delivery apparatus. 4,588,341, Cl. 414-32.000.

Motorola, Inc.: *See—*
Sun, Koushun, 4,588,933, Cl. 318-254.000.

Mount Sinai School of Medicine of the City University of New York: *See—*
Bucher, Doris J.; Khan, Mohamed W.; and Kharitonenkov, Igor G., 4,588,680, Cl. 435-5.000.

Moxham, John. Joining tubular members. 4,588,215, Cl. 285-382.200.

Moyne, Jose ; and Disdier, Camille, to Rhone-Poulenc Chimie de Base. Preparation of para-acyloxybenzene sulfonates. 4,588,532, Cl. 260-402.000.

Mruk, Norbert J.; Vaughan, Raymond C.; and Eddy, Arthur R., Jr., to Graphic Controls Corporation. Pressure sensitive adhesive compositions for medical electrodes. 4,588,762, Cl. 524-45.000.

MTU Motoren-und Turbinen-Union Munchen GmbH: *See—*
Thoma, Martin, 4,588,480, Cl. 204-37.100.

Mueller, Herbert; and Palm, Christof, to BASF Aktiengesellschaft. Preparation of tetrahydrofuran. 4,588,827, Cl. 549-509.000.

Mueller, Richard; Kerker, Lothar; and Peuckert, Cornelius, to Huels Aktiengesellschaft. Process for the production of acetylene and synthesis or reduction gas from coal in an electric arc process. 4,588,850, Cl. 585-539.000.

Mukoh, Akio: *See—*
Kaneko, Masaharu; Yoneyama, Tomio; Iwanami, Junko; Imazeki, Shuji; Mukoh, Akio; and Sato, Mikio, 4,588,517, Cl. 252-299.100.

Muller, Alexander, to General Electric Company. Method of assembling a rotatable assembly, apparatus and method of operating such. 4,587,721, Cl. 29-596.000.

Muller-Erwig, Horst, to Hermann Berstorff Maschinenbau GmbH. Method and apparatus for producing V-belts. 4,587,872, Cl. 83-18.000.

Muller, Erwin, to Ferag AG. Apparatus for the storage of flat products arriving in an imbricated formation, especially printed products. 4,587,790, Cl. 53-118.000.

Muller, Lutz: *See—*
Heiker, Fred R.; Muller, Lutz; Puls, Walter; and Bischoff, Hilmar, 4,588,710, Cl. 514-25.000.

Muller, Peter R.: *See—*
Scholl, Thomas; Preuss, Reinhard; Lachmann, Burkhard; Lower, Hartmut; and Muller, Peter R., 4,588,807, Cl. 528-272.000.

Multi-Tech Corporation: *See—*
Madnick, Herman; and Goldman, Ralph F., 4,587,672, Cl. 2-158.000.

Mumcu, Salih: *See—*
Bax, Hanns-Jorg; Horlbeck, Gernot; Feldmann, Rainer; and Mumcu, Salih, 4,588,785, Cl. 525-419.000.

Munekawa, Masaaki, to Showa Aluminum Corporation. Device for releasing heat. 4,588,023, Cl. 165-104.330.

Muntz, Ronald L.: *See—*
Manis, Paul A.; Martin, Eugene R.; and Muntz, Ronald L., 4,588,771, Cl. 524-731.000.

Murakata, Chikara: *See—*
Teranishi, Masayuki; Murakata, Chikara; Matsukuma, Ikuo; Shuto, Katsuichi; and Ichikawa, Shunji, 4,588,729, Cl. 514-263.000.

Muraoka, Hisashi: *See—*
Yonezawa, Toshio; and Muraoka, Hisashi, 4,587,928, Cl. 118-500.000.

Murase, Takao: *See—*
Kato, Nobuhide; and Murase, Takao, 4,588,494, Cl. 204-426.000.

Murata, Kazuhiko: *See—*
Oda, Hidekuni; Murata, Kazuhiko; Kajiura, Hirokazu; and Matsuda, Akira, 4,588,794, Cl. 526-169.200.

Murato Mfg. Co., Ltd.: *See—*
Yamamoto, Takashi; Takahashi, Hiroyuki; and Awata, Satoshi, 4,588,918, Cl. 310-348.000.

Murray, Norman R.; and Hunt, Harold R., to Phillips Petroleum Company. Indirect heat exchanger with baffles. 4,588,024, Cl. 165-109.100.

Murta, Raymond, to Coles Cranes Limited. Telescopic booms. 4,588,347, Cl. 414-685.000.

Muss, Manfred: *See—*
Hagemann, Fritz; Block, Hans-Jurgen; Hancke, Gustav; and Muss, Manfred, 4,587,979, Cl. 131-110.000.

Mustalampi, Reino: *See—*
Ikonen, Alpo; Lehtolahti, Raimo; and Mustalampi, Reino, 4,587,687, Cl. 15-314.000.

Mutoh Industry Ltd.: *See—*
Yoshida, Yasutomo, 4,587,742, Cl. 33-438.000.

Muzechuk, Richard A.: *See—*
Gold, Thomas P.; and Muzechuk, Richard A., 4,588,173, Cl. 267-140.100.

Myerscough, Paul F.: *See—*
Gisbourne, Bryan J.; and Myerscough, Paul F., 4,588,632, Cl. 428-212.000.

Nabisco Brands, Inc.: *See—*
Brown, James; Ellis, Peter E.; and Draper, Marta J., 4,588,602, Cl. 426-576.000.

Nadkarni, Anil V.; and Samal, Prasanna K., to SCM Corporation. Resistance welding electrode cap. 4,588,870, Cl. 219-119.000.

Nagase, Yukio: *See—*
Hosono, Nagao; Nagase, Yukio; Takeuchi, Tatsuo; Egami, Hidemi; and Satomura, Hiroshi, 4,589,053, Cl. 361-213.000.

Nagata, Masato: *See—*
Yamamoto, Tadashi; Nagata, Masato; and Oba, Tomoyuki, 4,588,378, Cl. 432-59.000.

Nagata, Minoru: *See—*
Kaneko, Kenji; Okabe, Takahiro; and Nagata, Minoru, 4,589,096, Cl. 365-154.000.

Nagata, Toru, to Canon Kabushiki Kaisha. Information input device for a camera. 4,588,273, Cl. 354-21.000.

Nagel, Dietmar: *See—*
Kennedy, Melvin R.; Nagel, Dietmar; and Arad, Abraham A., 4,588,386, Cl. 446-6.000.

Nagy, Janos: *See*—
Knoll, Jozsef; Nagy, Janos; Kalasz, Huba; and Knoll, Berta, 4,588,685, Cl. 435-69.000.

Naimpally, Saiprasad V.: *See*—
Fling, Russell T.; and Naimpally, Saiprasad V., 4,589,084, Cl. 364-745.000.

Naito, Motohiro, to Jeol Ltd. Sweeping process for mass spectrometer having superimposed fields. 4,588,889, Cl. 250-295.000.

Nakada, Akira; Okumura, Takatoshi; and Mizuno, Kotaro, to Nippon Gakki Seizo Kabushiki Kaisha. Automatic performing apparatus and data recording medium therefor. 4,587,878, Cl. 84-1.030.

Nakagomi, Tamihito; Toriyama, Kazuhisa; and Ito, Masatoshi, to Hitachi, Ltd. Nematic liquid crystal composition for display devices. 4,588,518, Cl. 252-299.610.

Nakajima, Junya: *See*—
Ishikawa, Takatoshi; and Nakajima, Junya, 4,588,677, Cl. 430-387.000.

Nakajima, Kichio: *See*—
Watanabe, Hiroshi; Izumi, Eiki; Aoyagi, Yukio; Honma, Kazuo; and Nakajima, Kichio, 4,587,808, Cl. 60-389.000.

Nakamaru, Kazuto: *See*—
Takegami, Keizo; Morita, Minoru; Nakamaru, Kazuto; and Miwa, Koji, 4,588,414, Cl. 23-295.00R.

Nakamori, Shigeru: *See*—
Tsuchida, Takayasu; Kurahashi, Osamu; Kawashima, Hiroki; Nakamori, Shigeru; and Enei, Hitoshi, 4,588,687, Cl. 435-108.000.

Nakamura, Kazuharu; Matsumoto, Motoki; Yoshino, Tooru; and Niha, Osamu, to Toyotomi Kogyo Co., Ltd. Safety device for pot-type oil burner. 4,588,371, Cl. 431-14.000.

Nakamura, Masao, to Fuji Photo Film Co., Ltd. Step tablet. 4,588,298, Cl. 356-443.000.

Nakamura, Minoru. Meat packing apparatus. 4,587,689, Cl. 17-41.000.

Nakamura, Mitsuki: *See*—
Matsumoto, Kou; Oota, Toshio; Asaka, Yugi; and Nakamura, Mitsuki, 4,587,828, Cl. 72-356.000.

Nakamura, Shinya: *See*—
Miki, Nobuaki; Nakamura, Shinya; and Shibata, Kazuhiko, 4,588,059, Cl. 192-3.280.

Nakamura, Teruo; Kiyoto, Michio; Akashi, Kazuo; and Hasegawa, Isao, to Japan Metals and Chemicals Co., Ltd. Mixed phosphatic fertilizer and process for producing the same. 4,588,431, Cl. 71-24.000.

Nakamura, Tsutomu; and Matsumoto, Kazuya, to Olympus Optical Co., Ltd. Solid state image sensor. 4,589,027, Cl. 358-213.000.

Nakamura, Yuzo; Uchino, Fumio; Tateoka, Hitoshi; and Ishibashi, Junichi, to Olympus Optical Co., Ltd. Mechanism for attaching ultrasonic head of ultrasonic microscope. 4,587,848, Cl. 73-632.000.

Nakane, Hisashi; Yokota, Akira; Yabuta, Mitsuo; and Ishii, Wataru, to Tok Yo Ohka Kogyo Co., Ltd. Method for fine pattern formation on a photoresist. 4,588,675, Cl. 430-325.000.

Nakane, Masami, to E. R. Squibb & Sons, Inc. Platelet aggregation inhibiting and bronchoconstriction inhibiting thiabicycloheptane substituted amino prostaglandin analog derivatives, compositions, and method of use therefor. 4,588,741, Cl. 514-443.000.

Nakane, Masami, to E. R. Squibb & Sons, Inc. Thiabicycloheptane substituted prostaglandin analogs useful in the treatment of thrombotic disease. 4,588,742, Cl. 514-443.000.

Nakanishi, Noriyoshi: *See*—
Mishina, Hidetoshi; Takahashi, Hiroshi; Iizuka, Hisatsugu; Nakanishi, Noriyoshi; Tateno, Noriaki; and Toeda, Shigetoshi, 4,587,941, Cl. 123-550.000.

Nakanishi, Tomoyuki, to Omron Tateisi Electronics Co. Paper feeding apparatus. 4,588,182, Cl. 271-121.000.

Nakano, Yoshikatsu: *See*—
Matsuura, Masaaki; and Nakano, Yoshikatsu, 4,587,936, Cl. 123-315.000.

Nakashima, Toshiaki: *See*—
Oono, Junji; Yano, Kenichi; Sato, Junichi; Kouda, Tadayuki; Ogawa, Yoichiro; Yokoi, Kouichi; and Nakashima, Toshiaki, 4,588,822, Cl. 549-417.000.

Nakasugi, Mikio; Yokomatsu, Takao; and Isohata, Junji, to Canon Kabushiki Kaisha. Static pressure bearing and transport device utilizing the same. 4,588,288, Cl. 355-53.000.

Nakata, Kazuo; Hosoya, Jun; Ohshima, Shigeru; and Sekiguchi, Takeshi, to Canon Kabushiki Kaisha. Color television camera with bias light device featuring reduced color shading. 4,589,015, Cl. 358-55.000.

Nakatani, Shirou: *See*—
Kanazawa, Hirotaka; Kanai, Seita; and Nakatani, Shirou, 4,588,198, Cl. 280-90.000.

Nakaya, Toshiharu; Uenaka, Akimitsu; and Ueda, Takanobu, to Nippon Paint Co., Ltd. Aqueous coating composition and preparation thereof. 4,588,759, Cl. 523-414.000.

Nakayama, Mitsuhito: *See*—
Shibata, Tomoyuki; and Nakayama, Mitsuhito, 4,588,353, Cl. 415-197.000.

Nalbantian, Charles A.: *See*—
Kreisher, John H.; Belle Isle, Hal D.; and Nalbantian, Charles A., 4,588,491, Cl. 204-299.00R.

Nalco Cehmical Company: *See*—
Allenson, Stephan J.; and Wagner, Stephen D., 4,588,508, Cl. 210-708.000.

Nalco Chemical Company: *See*—
Payne, Charles C., 4,588,421, Cl. 51-308.000.
Reven, Frederick V., 4,588,700, Cl. 501-31.000.

Namba, Hiromi, to Tokyo Shibaura Denki Kabushiki Kaisha. Character and image processing apparatus. 4,589,144, Cl. 382-61.000.

Nambu, Yutaka; Sugawara, Hitosi; and Saitoh, Yasuo, to Japan Tobacco & Salt Public Corporation, The. Method of controlling temperature of drying machine. 4,587,743, Cl. 34-31.000.

Nangai, Takashi: *See*—
Inazaki, Koji; Nangai, Takashi; Fujimori, Yasutomo; and Kimura, Hiroichi, 4,588,297, Cl. 356-376.000.

Nankoso Company Ltd.: *See*—
Takata, Junzo; Jinushi, Michio; Hashizume, Mitsuo; and Kobayashi, Mitsugu, 4,588,124, Cl. 237-1.00R.

Nanushian, Sergei R.: *See*—
Fedorov, Svyatoslav N.; Egorova, Eleonora V.; Spiridonov, Oleg P.; Nanushian, Sergei R.; Benenson, Igor L.; Degtev, Evgeny I.; Masterov, Vyacheslav N.; and Kiselev, Vladimir G., 4,588,406, Cl. 623-6.000.

Naoi, Keiji: *See*—
Isono, Keinosuke; and Naoi, Keiji, 4,588,407, Cl. 623-11.000.

Napierski, Reinhard. Electrical device for evaporating of active substances, preferably insecticides. 4,588,874, Cl. 219-271.000.

Napiorkowski, John J.: *See*—
Mickelson, N. Peter; and Napiorkowski, John J., 4,588,238, Cl. 339-91.00R.

Napper, Wallace. Apparatus and method for delimbing tree trunks. 4,588,008, Cl. 144-343.000.

Narasimhan, Kalathur S. V. L.; Willman, Carol J.; and Dulis, Edward J., to Crucible Materials Corporation. Oxygen containing permanent magnet alloy. 4,588,439, Cl. 75-123.00B.

Nashed, Wilson: *See*—
Ring, David F.; Nashed, Wilson; and Dow, Thurman, 4,588,400, Cl. 604-304.000.

NATEC: *See*—
Sagredos, Angelos N.; Papageorgiou, Vassilios P.; and Mellidis, Antonius S., 4,588,831, Cl. 556-137.000.

Nathasingh, Davidson M.; Datta, Amitava; Martis, Ronald J. J.; and DeCristofaro, Nicholas J., to Allied Corporation. Amorphous alloys for electromagnetic devices. 4,588,452, Cl. 148-108.000.

National Research Development Corp.: *See*—
Fenn, Robert; and Stroud, Raymond R., 4,588,873, Cl. 219-124.340.
Griffiths, Norman J., 4,587,772, Cl. 51-439.000.
Swinbanks, Malcolm A., 4,589,133, Cl. 381-71.000.

National Semiconductor Corporation: *See*—
Stimmell, James B., 4,589,056, Cl. 361-311.000.
Wile, Donald T., 4,588,968, Cl. 331-109.000.

National Starch and Chemical Corporation: *See*—
Schoenberg, Jules E.; Flanagan, Thomas P.; and Ray-Chaudhuri, Dilip K., 4,588,767, Cl. 524-272.000.

Natsuume, Tadao: *See*—
Kadono, Hiromitsu; and Natsuume, Tadao, 4,588,786, Cl. 525-327.600.

Navarro, Bernard J. Rack and pinion gear and process of fabrication. 4,588,336, Cl. 409-12.000.

Nebelung, Hermann H., to Emhart Industries, Inc. Parison transferring means. 4,588,068, Cl. 198-403.000.

Nebergall, Perry A.; and French, Robert C., to Shiley Incorporated. Cannula with radiopaque tip. 4,588,399, Cl. 604-280.000.

NEC Corporation: *See*—
Matsuda, Hajime; and Morito, Hiroshi, 4,589,005, Cl. 357-24.000.

Neitz, Alfred; and Monaghan, Michael L., to Maschinenfabrik Augsburg-Nurnberg. Fuel-injection nozzle. 4,588,132, Cl. 239-453.000.

Nelson, Dale K.; and Mathison, Allen D., to Cherne Industries, Inc. Portable waterproofing apparatus. 4,588,110, Cl. 222-135.000.

Nelson, Eugene D.: *See*—
Kohn, Thomas F.; Garland, Lester L.; and Nelson, Eugene D., 4,588,377, Cl. 432-50.000.

Nelson, Roy D., to Ball Corporation. Multi-laser switch. 4,588,262, Cl. 350-401.000.

Nemoto, Akira, to Tachikawa Spring Co., Ltd. Pan-type vehicle seat back mounted to a reclining mechanism. 4,588,228, Cl. 297-452.000.

Nemoto, Tsuneo; Koizumi, Osamu; and Sugawara, Koukichi, to Sony Corporation. Flexible disc cassette. 4,589,105, Cl. 369-291.000.

Neptune Corporation: *See*—
Swenson, Paula S., 4,588,387, Cl. 446-130.000.

Nesbitt, Dale D.: *See*—
Horowitz, Seymour M.; Nesbitt, Dale D.; Horowitz, Seymour M.; and Nesbitt, Dale D., 4,588,462, Cl. 156-177.000.
Horowitz, Seymour M.; Nesbitt, Dale D.; Horowitz, Seymour M.; and Nesbitt, Dale D., 4,588,462, Cl. 156-177.000.

Neturen Co., Ltd.: *See*—
Tanino, Morihiko, 4,589,059, Cl. 363-49.000.

Neubauer GmbH, Maschinenbau, Firma: *See*—
Schotten, Theodor, 4,587,960, Cl. 128-25.00R.

Neumann, Peter, to Sandoz Ltd. 2-piperazinyl-quinazoline derivatives and pharmaceutical compositions containing them. 4,588,725, Cl. 514-254.000.

New Directions Group, Inc., The: *See*—
Parker, William S.; and Stillman, Harold M., 4,588,383, Cl. 434-265.000.

New Draulics, Inc.: *See*—
Lind, Michael A.; and Dunn, Michael R., 4,587,732, Cl. 30-92.000.

Newbould, John, to General Motors Corporation. Capillary rheometer having disposable capillary tube. 4,587,837, Cl. 73-56.000.

Newby, Kenneth R.: *See*—
Chessin, Hyman; and Newby, Kenneth R., 4,588,481, Cl. 204-51.000.

Newsome, Reginald W.; and Hall, James E., to Philip Morris Incorporated. Folding carton and blank therefor, for cigarettes. 4,588,081, Cl. 206-251.000.

Newton, George W., to Trimm, Inc. Telephone jack assembly. 4,588,251, Cl. 339-182.00R.

NGK Insulators, Ltd.: *See*—
Kato, Nobuhide; and Murase, Takao, 4,588,494, Cl. 204-426.000.

Nguyen, Trung H.; and Hutchins, Clinton E., to Sprague Electric Company. Etching of aluminum capacitor foil. 4,588,486, Cl. 204-129.430.

Nichols, Steven F.: *See*—
Lulay, Lawrence O.; and Nichols, Steven F., 4,588,291, Cl. 355-77.000.

Nicolet Instrument Corporation: *See*—
Ghaderi, Sahba; Shohet, Juda L.; and Littlejohn, Duane P., 4,588,888, Cl. 250-291.000.
Niemeyer, Robert H., 4,588,319, Cl. 401-205.000.
Vidrine, D. Warren; and Allhands, Daniel R., 4,588,893, Cl. 250-428.000.

Niebylski, Leonard M.: *See*—
Zaweski, Edward F.; and Niebylski, Leonard M., 4,588,415, Cl. 44-57.000.
Zaweski, Edward F.; and Niebylski, Leonard M., 4,588,416, Cl. 44-57.000.

Nielson, Albert E.: *See*—
Griffith, Carroll L.; and Nielson, Albert E., 4,588,598, Cl. 426-312.000.

Niemeyer, Robert H., to Nicolet Instrument Corporation. Marking instrument. 4,588,319, Cl. 401-205.000.

Nieminen, Timo, to Instrumentarium Corp. Panoramic tomography X-ray apparatus. 4,589,122, Cl. 378-39.000.

Nightingale, Douglas J.; and Ward, Benjamin D., to Rolls-Royce Inc. Valve for diverting fluid flows in turbomachines. 4,587,803, Cl. 60-226.100.

Nigorikawa, Shigeru, to Alps Electric Co., Ltd. Rotor shaft support mechanism in oscillator. 4,589,055, Cl. 361-298.000.

Niha, Osamu: *See*—
Nakamura, Kazuharu; Matsumoto, Motoki; Yoshino, Tooru; and Niha, Osamu, 4,588,371, Cl. 431-14.000.

Niimura, Tsutomu: *See*—
Sato, Joichi; Shiono, Ryuji; Niimura, Tsutomu; Isogawa, Toshiaki; and Sato, Mitsuru, 4,589,021, Cl. 358-164.000.

Nimmagadda, Rao R.: *See*—
Uyehara, Hajime; and Nimmagadda, Rao R., 4,588,309, Cl. 384-94.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Nakada, Akira; Okumura, Takatoshi; and Mizuno, Kotaro, 4,587,878, Cl. 84-1.030.

Nippon Kogaku K. K.: *See*—
Hada, Kazunari; Fujii, Norio; Azuma, Toru; Kikuchi, Kaoru; and Hazama, Junji, 4,589,139, Cl. 382-8.000.
Shimizu, Yoshiyuki, 4,588,264, Cl. 350-414.000.
Takahashi, Tomowaki, 4,588,265, Cl. 350-415.000.

Nippon Paint Co., Ltd.: *See*—
Nakaya, Toshiharu; Uenaka, Akimitsu; and Ueda, Takanobu, 4,588,759, Cl. 523-414.000.

Nippon Seimitsu Kogyo Kabushiki Kaisha: *See*—
Kaise, Hitoshi, 4,588,276, Cl. 354-271.100.

Nippon Soken, Inc.: *See*—
Tokura, Norihito; Kawai, Hisasi; Kanehara, Kenji; and Kohama, Tokio, 4,587,843, Cl. 73-204.000.

Nippon Steel Corporation: *See*—
Inazaki, Koji; Nangai, Takashi; Fujimori, Yasutomo; and Kimura, Hiroichi, 4,588,297, Cl. 356-376.000.

Nippon Zeon Co., Ltd.: *See*—
Kadono, Hiromitsu; and Natsuume, Tadao, 4,588,786, Cl. 525-327.600.

Nippondenso Co., Ltd.: *See*—
Kaneiwa, Toshiyuki; and Shimamoto, Mamoru, 4,588,935, Cl. 318-483.000.
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Degnan, Thomas F.; and Pelrine, Bruce P., 4,588,560, Cl. 422-211.000.

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Keil, Karl-Heinz; Engelhardt, Fritz; Greiner, Ulrich; Sternberger, Klaus; and Pelster, Manfred, 4,588,413, Cl. 8-543.000.

Pennell, Raymond; and Reneau, Bobby J., to Gripper, Inc. Modular ball valve. 4,587,990, Cl. 137-454.200.

Pennsylvania Hospital: *See*—
Gasic, Gabriel J., 4,588,587, Cl. 424-95.000.

Pennwalt Corporation: *See*—
Kmiec, Chester J.; and Novits, Michael F., 4,588,752, Cl. 521-82.000.
Saeva, Grace A.; and Georgiev, Vassil S., 4,588,812, Cl. 544-250.000.

Pentalux Corporation: *See*—
Maclay, William R.; and Hewett, William A., 4,588,901, Cl. 307-141.000.

Perigard, Raymond G.: *See*—
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Perkin-Elmer Corporation, The: *See*—
Axelrod, Norman N., 4,588,293, Cl. 356-239.000.

Perkins, Douglas W.; and Petricca, Anthony V., to SCM Corporation. Pretreatment in encapsulation process. 4,588,612, Cl. 427-213.000.

Perner, Johannes: *See*—
Balzer, Wolf-Dieter; Bechtolsheimer, Hans-Heinrich; Beyer, Karl-Heinz; Fikentscher, Rolf; Perner, Johannes; Widder, Rudi; and Wolf, Helmut, 4,588,531, Cl. 260-402.000.

Perry, Elizabeth E.: *See*—
Embree, Milton L.; and Perry, Elizabeth E., 4,588,940, Cl. 323-313.000.

Peter, Klaus J., to FICHT GmbH. Evaluation circuit for the signals from an array of N photoconductors which are successively scanned in a fast rhythm. 4,589,079, Cl. 364-551.000.

Peternell, Hans; and Schnapauff, Rudolf, to U.S. Philips Corporation. Electrolytic capacitor. 4,589,058, Cl. 361-433.000.

Peters, David L., to Singer Company, The. Wide angle area-of-interest visual image projection system. 4,588,382, Cl. 434-44.000.

Petersen, Robert B., to Hitco. Reimpregnation resin comprising reaction product of metal complex and furfuryl alcohol. 4,588,799, Cl. 528-9.000.

Petersen, Uwe; Grohe, Klaus; Zeiler, Hans-Joachim; and Metzger, Karl G., to Bayer Aktiengesellschaft. 1-cyclopropyl-6-fluoro-1,4-dihydro-4-oxo-7-(3-oxo-1-piperazinyl)-3-quinolinecarboxylic acid antibacterial agents. 4,588,726, Cl. 514-254.000.

Peterson, Edward S.: *See*—
Triebel, Carol A.; Darden, Jerome W.; and Peterson, Edward S., 4,588,513, Cl. 252-75.000.

Peterson, James D.: *See*—
Strong, David W.; McGinnis, Patricia A.; Peterson, James D.; Ballmer, Steven A.; Raburn, Vern L.; Hall, Dorothy L.; and Fleck, David A., 4,588,074, Cl. 206-45.150.

Petricca, Anthony V.: *See*—
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Petrolite Corporation: *See*—
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Peuckert, Cornelius: *See*—
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Pezzolo, Donald E., to Intermatic Incorporated. Anti-flicker circuit for automatic turn-on of nightlight. 4,588,926, Cl. 315-155.000.

Pfaff Industriemaschinen GmbH: *See*—
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Pfizer Inc.: *See*—
Pirie, Donald K.; Volkmann, Robert A.; and Kleinman, Edward F., 4,588,527, Cl. 260-245.20R.

Pfleiderer, Peter M., to Boeters, Bauer & Partner. Process for the production of a sound recording and a device for carrying out the process. 4,589,128, Cl. 381-17.000.

Phifer Wire Products, Inc.: *See*—
Brooks, James S., 4,587,997, Cl. 139-420.00R.

Philip Morris Incorporated: *See*—
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Newsome, Reginald W.; and Hall, James E., 4,588,081, Cl. 206-251.000.
Phillips Petroleum Company: *See*—
Beever, William H., 4,588,765, Cl. 524-140.000.
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Drake, Charles A.; and Loffer, Bill, 4,588,704, Cl. 502-111.000.
Henderson, E. Webb, 4,588,557, Cl. 422-108.000.
Kukes, Simon G.; and Parrott, Stephen L., 4,588,706, Cl. 502-211.000.
McClintock, William A., 4,588,027, Cl. 165-159.000.
Murray, Norman R.; and Hunt, Harold R., 4,588,024, Cl. 165-109.100.
Scoggins, Lacey E.; and Senatore, Guy, 4,588,789, Cl. 525-537.000.
Warzel, F. Morgan, 4,588,476, Cl. 196-14.520.
Warzel, F. Morgan, 4,588,478, Cl. 202-99.000.
Physio Technology, Inc.: *See*—
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Pierburg GmbH & Co. KG: *See*—
Ehrentraut, Franz-Josef; and Henning, Manfred, 4,587,883, Cl. 91-363.00R.
Pierce, Dale E.: *See*—
Cowan, Kiplin D.; Pierce, Dale E.; and Nowlin, Oscar D., 4,588,703, Cl. 502-111.000.
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Pierce, Paul E., to United States of America, Energy. Hardware multiplier processor. 4,589,085, Cl. 364-754.000.
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Toscano, Luciano, 4,588,712, Cl. 514-29.000.
Piesch, Ernst; and Burgkhardt, Bertram, to Kernforschungszentrum Karlsruhe GmbH. Apparatus for measuring dose energy in stray radiation fields. 4,588,898, Cl. 250-390.000.
Pietsch, Hanns; Hohmann, Volker; and Kluck, Detlef, to Beiersdorf Aktiengesellschaft. Surgical material. 4,588,583, Cl. 424-81.000.
Piguet, Albert; and Dubois, Jean-Daniel, to Nouvelle Lemania S.A. Electronic chronograph watch having analog and digital display of measured time periods. 4,588,305, Cl. 368-185.000.
Pillan, Antonio: *See*—
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Piova, Jean-Luc: *See*—
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Pirie, Donald K.; Volkmann, Robert A.; and Kleinman, Edward F., to Pfizer Inc. Process for preparing penicillanic acid 1,1-dioxide derivatives. 4,588,527, Cl. 260-245.20R.
Pitney Bowes Inc.: *See*—
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Pizzi, Giordano; and Gargioni, Domenico. Device for quickly locking the paint containing vessels in apparatus for mixing paints and the like. 4,588,302, Cl. 366-349.000.
Place, William C., to Honeywell Inc. Remote data gathering panel. 4,589,088, Cl. 364-900.000.
Plahm, David: *See*—
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Plascore, Inc.: *See*—
Huebner, Fritz, 4,588,543, Cl. 264-248.000.
Plastic Oddities, Inc.: *See*—
Ridings, Jody W., 4,588,082, Cl. 206-349.000.
Pletka, Hans-Dieter: *See*—
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Pokorny, Erich; and Bailer, Norbert, to Vollmer Werke Maschinenfabrik GmbH. Control mechanism for a machine for working on saws. 4,587,867, Cl. 76-25.00R.
Polaroid Corporation: *See*—
Dolphin, John M., 4,588,672, Cl. 430-218.000.
Fielding, Herbert L.; and Ingwall, Richard T., 4,588,664, Cl. 430-1.000.
van der Meer, Jan, 4,588,275, Cl. 354-150.000.
Poldy, Carlo; and Hopfmuller, Gebhard, to AKG Akustische u.Kino-Gerate GmbH. Circuit for suppressing amplitude peaks caused by stop consonants in an electroacoustic transmission system. 4,589,136, Cl. 381-94.000.
Pollmann, Siegfried; and Raupach, Gabriele, to L. & C. Steinmuller GmbH. Method of binding sulfur compounds, which result as reaction products during the combustion of sulfur-containing fuels, by addition of additives. 4,588,568, Cl. 423-244.000.
Polysar Limited: *See*—
Edwards, Douglas C.; and Crossman, James A., 4,588,780, Cl. 525-184.000.
Pomper, Michael: *See*—
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Portable Power Tools, Inc.: *See*—
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Porter, John B.; Altmann, David W.; Mattedi, Bruno A.; and Jones, Ralph, to Analogic Corporation. Full floating point vector processor with dynamically configurable multifunction pipelined ALU. 4,589,067, Cl. 364-200.000.
Porucznik, Paul: *See*—
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Potter, Frank. Rotary file cabinet. 4,588,236, Cl. 312-201.000.
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McGraw, William E.; and Stegner, Daniel E., 4,588,357, Cl. 417-34.000.
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PPG Industries, Inc.: *See*—
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Prince, John S.; Herz, Harold L.; and Coleman, Edward P., Jr., to General Electric Company. Brightness control system for CRT video display. 4,589,022, Cl. 358-168.000.
Priscott, Daniel R., to Burroughs Corp. Automatic plant shutdown equipment. 4,588,884, Cl. 250-223.00R.
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Procter & Gamble Company, The: *See*—
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Prouty, Dwight. Trousers with built in shaping straps. 4,587,675, Cl. 2-227.000.
Provonchee, Richard B., to FMC Corporation. Device for use in chemical reactions and analyses. 4,588,555, Cl. 422-72.000.
Pudenz-Schulte Medical Research Corp.: *See*—
Schulte, Rudolf R.; East, Gary P.; and Heindle, Alfons, 4,588,394, Cl. 604-9.000.
Puhak, Peter G.; and Rehkopf, Charles H., to North American Philips Consumer Electronics Corp. Connective-protective adapter for a CRT base. 4,588,250, Cl. 339-144.00T.
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Purohit, Ankur, to United States of America, Energy. Nitriding of super alloys for enhancing physical properties. 4,588,450, Cl. 148-20.300.
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Quaker Oats Company, The: *See—*
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Auslander, Marc A.; Cocke, John; Hao, Hsieh T.; Markstein, Peter W.; and Radin, George, 4,589,087, Cl. 364-768.000.
Radtke, Ernst-Rudolf, to Honeywell GmbH. Position sensor. 4,589,038, Cl. 360-79.000.
Raimond, Michel, to Elf France. Process and equipment for sampling a gaseous effluent and their application to chromatography. 4,588,422, Cl. 55-67.000.
Raines, Max, to USM Corporation. Workpiece holding device for automatic sewing. 4,587,910, Cl. 112-121.120.
Ramsey, Mark S.; and Stolle, Joseph W., to Exxon Production Research Co. Downhole self-aligning latch subassembly. 4,588,243, Cl. 339-65.000.
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Rao, Madana K. N., to AT&T Bell Laboratories. Amplifier with extended output drive capability. 4,588,961, Cl. 330-267.000.
Rascle, Roger; and Lange, Francois, to Thomson-CSF. Apparatus for removal of a data carrier disk after molding. 4,588,369, Cl. 425-437.000.
Ratcliff, Henry K. Drive circuit for an ultrasonic generator system. 4,588,917, Cl. 310-316.000.
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Faulkner, Richard D., 4,588,922, Cl. 313-533.000.
Fling, Russell T.; and Naimpally, Saiprasad V., 4,589,084, Cl. 364-745.000.
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Reinlein, Karl-Heinz; and Stablein, Bruno, to Fulgurit GmbH & Co. Kommanditgesellschaft. Apparatus for electrostatic spray-enameling. 4,587,924, Cl. 118-70.000.
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Rikiishi, Tetuo: *See—*
Shimizu, Shinichi; Rikiishi, Tetuo; and Koyama, Yasuo, 4,588,134, Cl. 241-21.000.

Ring, David F.; Nashed, Wilson; and Dow, Thurman, to Johnson & Johnson Products, Inc. Liquid loaded pad for medical applications. 4,588,400, Cl. 604-304.000.

Riondel, Pierre, to BBC Brown, Boveri & Company, Ltd. Slip-limiting control for rail vehicles. 4,588,932, Cl. 318-52.000.

Riordan, John C.: *See—*
Pearlman, Jay S.; Riordan, John C.; and Valencia, Vance I., 4,589,123, Cl. 378-106.000.

Rippie, Wallace. Noncorrosive de-icing composition and method comprising calcium and magnesium carboxylate. 4,588,512, Cl. 252-70.000.

Riso Kagaku Corporation: *See—*
Oshio, Susumu, 4,587,900, Cl. 101-382.0MV.

RMG-Beierling GmbH, Industriestr: *See—*
Beierling, Klemens; and Beierling, Hans-Jurgen, 4,587,927, Cl. 118-326.000.

Robert Bosch GmbH: *See—*
Dobler, Klaus; and Grunwald, Werner, 4,587,840, Cl. 73-119.00A.
Ehrentraut, Franz-Josef; and Henning, Manfred, 4,587,883, Cl. 91-363.00R.
Handtmann, Dieter, 4,587,842, Cl. 73-204.000.
Hemminger, Herman; Jundt, Werner; Weller, Sybille; and Werner, Peter, 4,587,939, Cl. 123-479.000.
Hesser, Paul, 4,588,880, Cl. 235-376.000.
Schmid, Walter, 4,587,940, Cl. 123-503.000.
Sumal, Jaihind S., 4,587,844, Cl. 73-204.000.

Robeson, Lloyd M.: *See—*
Hartsing, Tyler F., Jr.; Sauers, Marvin E.; and Robeson, Lloyd M., 4,588,623, Cl. 428-36.000.

Robinson, Jeffrey I.: *See—*
Watts, Kevin P.; and Robinson, Jeffrey I., 4,588,858, Cl. 179-16.0AA.

Rock, Eugene F.: *See—*
Young, Ronald L.; Rock, Eugene F.; and Brandt, David E., 4,588,226, Cl. 297-349.000.

Rockcor, Inc.: *See—*
Chiu, Jessie T., 4,588,637, Cl. 428-355.000.

Rockwell International Corporation: *See—*
Dorsman, Adrian K., 4,588,984, Cl. 340-347.0NT.
Godejahn, Gordon C., Jr., 4,587,711, Cl. 29-571.000.
Golecki, Ilan, 4,588,447, Cl. 148-1.500.
Israeli, Leonardo, 4,588,651, Cl. 428-594.000.
Morey, William A., 4,589,032, Cl. 358-242.000.

Rodriguez, Raymond L.: *See—*
Kado, Clarence I.; Rodriguez, Raymond L.; Froman, Byron E.; and Tait, Robert C., 4,588,689, Cl. 435-199.000.

Rodriguez, Richard, Jr.; and Israel, Joseph, to American Hospital Supply Corporation. Open, wraparound, sleeved garment. 4,587,671, Cl. 2-69.000.

Rodriguez, Saulo V., to Economove Corporation. Four post lift and track adjusting means therefor. 4,588,048, Cl. 187-8.670.

Rogers Corporation: *See—*
Short, W. Harry, 4,589,057, Cl. 361-386.000.

Rohm and Haas Company: *See—*
Emmons, William D.; and Warburton, Charles E., Jr., 4,588,788, Cl. 525-531.000.
Lange, Barry C.; and Szapacs, Edward M., 4,588,487, Cl. 204-157.820.

Rohner, Nicholas J. Roofing shingles. 4,587,785, Cl. 52-420.000.

Roll Form Products, Inc.: *See—*
Confer, Merle A., 4,588,853, Cl. 174-48.000.

Roll, Ulrich: *See—*
Fahnrich, Hans-Jurgen; and Roll, Ulrich, 4,588,925, Cl. 315-101.000.

Rollins, William R.: *See—*
Albright, Harold D., Jr.; and Rollins, William R., 4,588,040, Cl. 180-165.000.

Rolls-Royce Inc.: *See—*
Nightingale, Douglas J.; and Ward, Benjamin D., 4,587,803, Cl. 60-226.100.

Rolls-Royce Limited: *See—*
Seymour, Stephen R., 4,588,954, Cl. 328-151.000.

Roloff, Herbert F.; and Kollner, Hartwig W., to Siemens Aktiengesellschaft. Integrated sensor for force and motion. 4,588,975, Cl. 338-5.000.

Roman Arch and Culvert Corporation of America: *See—*
Miller, George R., 4,587,684, Cl. 14-24.000.

Rorden, Louis H.; and Fraser, Edward C., to Develco, Inc. Ball inclinometer. 4,587,741, Cl. 33-366.000.

Rorke, Andrew J., to Ebb Tide Pty., Ltd. Spiral staircase. 4,587,780, Cl. 52-187.000.

Rosenbaum, Robert S.: *See—*
Kessler, Jack H.; and Rosenbaum, Robert S., 4,588,586, Cl. 424-94.000.

Rosenberg, Larry. Programming format and apparatus for the improved coherent beam coupler system and method. 4,589,078, Cl. 364-524.000.

Rosenburg, Dana G.: *See—*
Mahoney, Kenneth J.; Rosenburg, Dana G.; and Mahoney, Thomas H., 4,588,188, Cl. 273-1.50R.

Rosene, Michael R., to Calgon Carbon Corporation. Sweetener solution purification process. 4,587,953, Cl. 127-46.200.

Ross, Alex J. Fishing slingshot fixture. 4,587,943, Cl. 124-20.00R.

Ross, William A.; and Terry, Kenneth A., to Pitney Bowes Inc. Thermal ribbon cartridge transport in a postage meter thermal printer. 4,588,996, Cl. 346-76.0PH.

Rossi, Alfred F.; Johns, Albert D.; Malakhow, Walter; and Michalec, George W., to James River Corporation of Virginia. Process and press with a controlled pressure system. 4,588,539, Cl. 264-40.500.

Rossnagel, Stephen M.: *See—*
Cuomo, Jerome J.; Kaufman, Harold R.; and Rossnagel, Stephen M., 4,588,490, Cl. 204-298.000.

Roth, David W., to 2500 Corporation, The. Floor mat. 4,588,628, Cl. 428-85.000.

Rothenberger, Roland D., to Sperry Corporation. Fully scan-set testable embedded edge-triggered dual D and J-K flip-flops through testing as inverter strings. 4,588,944, Cl. 324-73.00R.

Rothman, James C.: *See—*
Gillingham, Gary R.; and Rothman, James C., 4,588,423, Cl. 55-117.000.

Rotopack GmbH: *See—*
Heitele, Jurgen; and Kemmler, Rudolf, 4,588,390, Cl. 493-133.000.

Roudebush, H. Richard: *See—*
O'Brien, Lawrence B.; Winston, Walter F.; Abner, Edmund L.; Atkinson, Lowell G.; Roudebush, H. Richard; Buehler, William L.; Berastresser, Jim K.; and Messick, Walker A., 4,588,318, Cl. 401-146.000.

Roussel Uclaf: *See—*
Barthelemy, Pierre; and Desmazeaud, Michel, 4,588,593, Cl. 426-36.000.
Barthelemy, Pierre; and Lablee, Jean, 4,588,594, Cl. 426-36.000.
Humbert, Daniel; Gasc, Jean-Claude; and Hunt, Peter F., 4,588,731, Cl. 514-293.000.
Tully, Wilfred R., 4,588,720, Cl. 514-217.000.

Routery, Edward E.: *See—*
Townsend, Donald W.; and Routery, Edward E., 4,587,951, Cl. 126-438.000.

Rowe International, Inc.: *See—*
Collins, James D., 4,588,292, Cl. 356-71.000.

Rubner, Anthony C.: *See—*
Chu, Raymond D.; Rubner, Anthony C.; and Bergman, Marc A., 4,587,967, Cl. 128-204.210.

Ruck, George E.; and Stefani, Michael H., to Ford Motor Company. Method of joining a molded first part to a mating part carrying a first thread member. 4,587,705, Cl. 29-450.000.

Ruderian, Max J. Hot and cold therapeutic applicator. 4,587,959, Cl. 128-24.100.

Ruegg, Josef N., to Southern Can Company. Safety vent for containers. 4,588,101, Cl. 220-89.00A.

Ruehl, William E.; and DeMarco, Joseph P., to Illinois Tool Works Inc. Stucco wall fastener. 4,588,152, Cl. 248-71.000.

Ruehl, William E.; and Swick, Edwin G. Bridging clip. 4,588,240, Cl. 339-19.000.

Ruiz, Gilbert G. X-ray film holder for patient in wheelchair. 4,589,124, Cl. 378-178.000.

Ruiz, Rudolfo M.: *See—*
Bertagna, Richard A.; and Ruiz, Rudolfo M., 4,588,868, Cl. 179-156.00R.

Rupp, Robert W. Portable soap holder. 4,588,075, Cl. 206-77.100.

Ruvo Automation Corp.: *See—*
Jangaard, Erling S., 4,588,006, Cl. 144-3.00R.

Ryobi Ltd.: *See—*
Uetsuki, Haruo; and Yorikane, Toshiaki, 4,588,141, Cl. 242-84.10J.

Rzeszewski, Theodore S., to AT&T Bell Laboratories. Single sideband modulated chrominance information for compatible high-definition television. 4,589,011, Cl. 358-12.000.

S & N Manufacturing, Inc.: *See—*
Stewart, James R.; and Allen, Charles F., 4,588,190, Cl. 273-29.00A.

S. T. Dupont: *See—*
Calgaro, Honore ; and Grossiord, Claude, 4,588,374, Cl. 431-344.000.

Saab-Scania Aktiebolag: *See—*
Nordstrom, Lennart, 4,589,061, Cl. 364-157.000.

Sablier, Robert: *See—*
Auchapt, Pierre; Sablier, Robert; Symard, Jose ; and Seyfried, Philippe, 4,588,524, Cl. 252-626.000.

Saeva, Grace A.; and Georgiev, Vassil S., to Pennwalt Corporation. Substituted 2,3-dihydro-5H-thiazolo[2,3,-b]quinazoline derivatives. 4,588,812, Cl. 544-250.000.

Sagredos, Angelos N.; Papageorgiou, Vassilios P.; and Mellidis, Antonius S., to NATEC. Platinum complex compounds of substituted 5,8-dihydroxyl-1,4-naphthoquinone, and process for their production and use. 4,588,831, Cl. 556-137.000.

Saiki, Koji: *See—*
Sakurai, Yoshifumi; Numata, Takuhisa; Saito, Kazuo; and Saiki, Koji, 4,588,647, Cl. 428-457.000.

Saitama Bee-Keeping Co., Ltd.: *See—*
Shimizu, Shinichi; Rikiishi, Tetuo; and Koyama, Yasuo, 4,588,134, Cl. 241-21.000.

Saito, Hideyuki, to Nissan Motor Co., Ltd. Temperature measuring device with thermocouple. 4,588,308, Cl. 374-181.000.

Saito, Kazuo: *See—*
Sakurai, Yoshifumi; Numata, Takuhisa; Saito, Kazuo; and Saiki, Koji, 4,588,647, Cl. 428-457.000.

Saito, Masayuki: *See—*
Sumita, Osao; Saito, Masayuki; Itou, Hisao; Kobayashi, Masahito; and Furutani, Yasumasa, 4,588,488, Cl. 204-145.00R.

Saito, Seitoku: *See—*
Kobuke, Takayoshi; Izumi, Toshiaki; Saito, Seitoku; and Fukuda, Kazumasa, 4,588,654, Cl. 428-626.000.

Saito, Syobu, to Hitachi, Ltd. Scanning type electron microscope. 4,588,891, Cl. 250-310.000.

Saito, Toshiyuki; Tokumitsu, Yasuyuki; Okubo, Naofumi; Daido, Yoshimasa; and Kurihara, Hiroshi, to Fujitsu Limited. Device for distributing and combining microwave electric power. 4,588,962, Cl. 330-286.000.

Saitoh, Koichi: *See*—
Nishimura, Nobuo; Itami, Teruhiko; Kimoto, Toshifumi; and Saitoh, Koichi, 4,588,995, Cl. 346-74.200.

Saitoh, Shigeru; Shimada, Masaaki; and Imura, Takeshi, to Kureha Kagaku Kogyo Kabushiki Kaisha. Apparatus for purifying crystals. 4,588,562, Cl. 422-245.000.

Saitoh, Takeshi: *See*—
Noda, Masaki; Shinkawa, Keiro; Saitoh, Takeshi; Hatashita, Hiroshi; and Matsuura, Shigeo, 4,589,016, Cl. 358-118.000.

Saitoh, Yasuo: *See*—
Nambu, Yutaka; Sugawara, Hitosi; and Saitoh, Yasuo, 4,587,743, Cl. 34-31.000.

Sakaguchi, Shinji: *See*—
Kataoka, Shinzi; Shinagawa, Yukio; and Sakaguchi, Shinji, 4,588,673, Cl. 430-264.000.

Sakai, Kazuo: *See*—
Utaka, Katsuyuki; Sakai, Kazuo; Akiba, Shigeyuki; and Matsushima, Yuichi, 4,589,117, Cl. 372-50.000.

Sakai, Kenji; Wakabayashi, Takeshi; Fukuzawa, Kakumasa; and Hiraoka, Teruzo, to Mitsubishi Jukogyo Kabushiki Kaisha; and Chuo Denshi Kabushiki Kaisha. Automatic examination system for motor vehicles. 4,587,838, Cl. 73-116.000.

Sakai Manufacturing Co., Ltd.: *See*—
Sakai, Yoshitaka, 4,588,389, Cl. 474-43.000.

Sakai, Shigeki; Tateno, Hiroshi; and Kataoka, Shoei, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. Quasiparticle injection control type superconducting device. 4,589,001, Cl. 357-5.000.

Sakai, Yoshitaka, to Sakai Manufacturing Co., Ltd. Pulley device. 4,588,389, Cl. 474-43.000.

Sakakibara, Mitsuhiko: *See*—
Ono, Hisao; Tsutsumi, Fumio; Sakakibara, Mitsuhiko; and Okuya, Eitaro, 4,588,782, Cl. 525-245.000.

Sakamoto, Takao, to Tachikawa Spring Co., Ltd. Height adjustment mechanism for a vehicle seat. 4,588,225, Cl. 297-346.000.

Sakata, Kei; Tanaka, Kazunori; and Aiuchi, Kazunori, to Duplo Seizo Kabushiki Kaisha. Double-feed prevention device in paper feeding apparatus. 4,588,181, Cl. 271-121.000.

Sakaue, Kunio: *See*—
Imai, Takaichi; Yamada, Takeshi; Sakaue, Kunio; Isoyama, Eizo; Mizoguchi, Masaaki; and Tanaka, Katsumi, 4,588,025, Cl. 165-133.000.

Sakurai, Michikazu: *See*—
Kadomatsu, Yasuo; Tajima, Shoji; Miyazaki, Yoshio; Anze, Kimio; and Sakurai, Michikazu, 4,587,699, Cl. 29-121.100.

Sakurai, Yoshifumi; Numata, Takuhisa; Saito, Kazuo; and Saiki, Koji, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Perpendicular magnetization film and the preparation thereof. 4,588,647, Cl. 428-457.000.

Salama, Clement A.; and Malhi, Satwinder D., to University of Toronto Innovations Foundation. Output circuits of class B type electronic amplifiers. 4,588,960, Cl. 330-264.000.

Salazar, Jose A.: *See*—
Morales, Alfredo L.; Galiasso, Roberto; Carrasquel, Angel R.; and Salazar, Jose A., 4,588,709, Cl. 502-314.000.

Salo, Rodney W.; and Pederson, Brian D., to Cardiac Pacemakers, Inc. Dimension sensitive angioplasty catheter. 4,587,975, Cl. 128-693.000.

Salyer, Ival O.; Griffen, Charles W.; and Duvall, Donovan S., to University of Dayton. Intumescent fire extinguishing solutions. 4,588,510, Cl. 252-5.000.

Samal, Prasanna K.: *See*—
Nadkarni, Anil V.; and Samal, Prasanna K., 4,588,870, Cl. 219-119.000.

Sanden Corporation: *See*—
Koisuka, Mikio; and Aoki, Hisao, 4,587,701, Cl. 29-157.30A.

Sanders, Ian L.: *See*—
Jen, Shen; Kabelac, William J.; and Sanders, Ian L., 4,589,037, Cl. 360-77.000.

Sandoz, Inc.: *See*—
Damon, Robert E., II, 4,588,715, Cl. 514-63.000.

Sandoz Ltd.: *See*—
Baumann, Hans-Peter; Speiser, Carl T.; and Weisskopf, Ernst, 4,588,448, Cl. 148-6.270.
Neumann, Peter, 4,588,725, Cl. 514-254.000.

Sandstrom, Christer. Oil burner. 4,588,375, Cl. 431-354.000.

Sangamo Weston, Inc.: *See*—
Becker, Dale F.; and Venaas, Norman B., 4,588,949, Cl. 324-110.000.
Goodwin, R. Wendell, 4,588,982, Cl. 340-347.00P.

Sanshin Kogyo Kabushiki Kaisha: *See*—
Suzuki, Tomonori; and Toyohara, Makoto, 4,588,385, Cl. 440-88.000.
Yamazaki, Toshiyuki, 4,587,935, Cl. 123-198.00R.

Santurtun, Carlos M.; Ceca, Felix L.; and Benegoechea, Jose M. Q., to General Electric Company. Second breakdown protection circuit for X-ray generator inverter. 4,589,051, Cl. 361-88.000.

Sanz, Delio, to C-I-L Inc. Anodic protection system and method. 4,588,022, Cl. 165-1.000.

Sarstedt, Walter, to Walter Sarstedt Kunststoff-Spritzgusswerk. Arrangement for placing a separating gel between two phases located in a sample tube. 4,588,556, Cl. 422-101.000.

Sasser, Myron: *See*—
Lumsden, Robert D.; and Sasser, Myron, 4,588,584, Cl. 424-93.000.

Sato, Isao: *See*—
Ohmori, Takashi; Sato, Isao; Ishibashi, Yoji; Minakawa, Yoshimitsu; Kuroda, Michio; and Tamura, Zensuke, 4,587,809, Cl. 60-737.000.

Sato, Joichi; Shiono, Ryuji; Niimura, Tsutomu; Isogawa, Toshiaki; and Sato, Mitsuru, to Sony Corporation. Gamma compensating circuit. 4,589,021, Cl. 358-164.000.

Sato, Junichi: *See*—
Oono, Junji; Yano, Kenichi; Sato, Junichi; Kouda, Tadayuki; Ogawa, Yoichiro; Yokoi, Kouichi; and Nakashima, Toshiaki, 4,588,822, Cl. 549-417.000.

Sato, Mikio: *See*—
Kaneko, Masaharu; Yoneyama, Tomio; Iwanami, Junko; Imazeki, Shuji; Mukoh, Akio; and Sato, Mikio, 4,588,517, Cl. 252-299.100.

Sato, Mitsuru: *See*—
Sato, Joichi; Shiono, Ryuji; Niimura, Tsutomu; Isogawa, Toshiaki; and Sato, Mitsuru, 4,589,021, Cl. 358-164.000.

Satoh, Kiyoe: *See*—
Maruyama, Tsutomu; Ikoma, Mitugi; and Satoh, Kiyoe, 4,588,601, Cl. 426-574.000.

Satomura, Hiroshi: *See*—
Hosono, Nagao; Nagase, Yukio; Takeuchi, Tatsuo; Egami, Hidemi; and Satomura, Hiroshi, 4,589,053, Cl. 361-213.000.

Satoo, Takanori: *See*—
Shimizu, Toshio; Satoo, Takanori; Doi, Ryota; Yamaguchi, Motoo; Tsukui, Tsutomu; and Yoshioka, Yoshio, 4,588,660, Cl. 429-35.000.

Sattlegger, Hans: *See*—
Wurminghausen, Thomas; Saykowski, Franz; and Sattlegger, Hans, 4,588,770, Cl. 524-731.000.

Saudray, Didier; and Auchapt, Pierre, to Commissariat a l'Energie Atomique. Electromagnetic filter. 4,588,507, Cl. 210-695.000.

Sauers, Marvin E.: *See*—
Hartsing, Tyler F., Jr.; Sauers, Marvin E.; and Robeson, Lloyd M., 4,588,623, Cl. 428-36.000.

Saulgeot, Claude, to Compagnie Industrielle des Telecommunications Cit-Alcatel. High vacuum rotary pump. 4,588,361, Cl. 417-424.000.

Savioli, Giulio V., to United States of America, Army. Weapon cartridge feeder apparatus and method. 4,587,879, Cl. 89-33.250.

Savit, Carl H., to Western Geophysical Company of America. Method and apparatus for positioning seismic arrays. 4,589,100, Cl. 367-77.000.

Sawada, Kenji: *See*—
Koto, Haruhiko; Okada, Junichi; Ishii, Hiroshi; and Sawada, Kenji, 4,589,000, Cl. 346-140.00R.

Sawada, Takashi; Morimoto, Tomiaki; Miyoshi, Isao; Taguchi, Hirokuni; Tohmatsu, Junichi; and Kitamura, Toyohiro, to Eisai Co., Ltd. Process for producing adult T cell leukemia associated antigen. 4,588,681, Cl. 435-5.000.

Saykowski, Franz: *See*—
Wurminghausen, Thomas; Saykowski, Franz; and Sattlegger, Hans, 4,588,770, Cl. 524-731.000.

Scapa-Porritt Limited: *See*—
Gisbourne, Bryan J.; and Myerscough, Paul F., 4,588,632, Cl. 428-212.000.

Scarnato, Franco: *See*—
Brugger, Kurt, 4,587,680, Cl. 4-519.000.

Schaad, Werner: *See*—
Bolleter, Ulrich; and Schaad, Werner, 4,587,995, Cl. 139-1.00R.

Schad, Robert D., to Husky Injection Molding Systems Ltd. Clamp mechanism. 4,588,364, Cl. 425-135.000.

Schad, Robert D., to Husky Injection Molding Systems Ltd. Hot runner manifold for injection molding machine. 4,588,367, Cl. 425-549.000.

Schaeffel, John A., Jr.; Madderra, Jimmy M.; and West, Ronald L., to United States of America, Army. Biaxial folding lever wing. 4,588,146, Cl. 244-3.270.

Schatteman, Etienne A. M.; and Denis, Philippe V., to Staar S.A. Linear changer apparatus. 4,589,101, Cl. 369-38.000.

Schatz, Klaus W.: *See*—
Kam, Anthony Y.; Krambeck, Frederick J.; and Schatz, Klaus W., 4,588,558, Cl. 422-113.000.

Schaub, Andres: *See*—
Scheibli, Peter; Kanzig, Alex; and Schaub, Andres, 4,588,411, Cl. 8-528.000.

Schawel, Kenneth W.: *See*—
Brennan, Eric L.; and Schawel, Kenneth W., 4,587,793, Cl. 53-425.000.

Scheibli, Peter; Kanzig, Alex; and Schaub, Andres, to Ciba-Geigy Corporation. Long-shelflife print containing reactive dye and alkali acetate pastes and their use. 4,588,411, Cl. 8-528.000.

Scheid, John P.: *See*—
Evans, James W.; Scheid, John P.; and Eichinger, Daniel R., 4,588,391, Cl. 493-165.000.

Scheller, Wilfred R.: *See*—
McDowell, Paul W.; and Scheller, Wilfred R., 4,588,242, Cl. 339-59.00M.

Scherzer, Julius, to Union Oil Company of California. Process for the catalytic cracking of metals-containing feedstocks. 4,588,496, Cl. 208-120.000.

Schildkraut, Alan L.; and Brush, Robert W., Sr., to Allied Corporation. Anti-decoupling mechanism for an electrical connector assembly. 4,588,246, Cl. 339-89.00R.

Schlintz, Neal L.: *See—*
Crenshaw, Susan L. H.; Schlintz, Neal L.; and Moore, Danny R., 4,588,457, Cl. 156-62.800.

Schloens, Hans-Heinrich: *See—*
Kollmeier, Hans-Joachim; and Schloens, Hans-Heinrich, 4,588,755, Cl. 521-112.000.

Schlumberger Technology Corporation: *See—*
Ohmer, Herve , 4,588,951, Cl. 324-367.000.

Schmid, Hermann: *See—*
Lam, Jack F.; and Schmid, Hermann, 4,589,066, Cl. 364-200.000.

Schmid, Johann J.; and Thie, Werner, to Willi Studer AG, Fabrik fur elektronische Apparate. Method of, and apparatus for, determining the starting point and the end point of closed signal patterns. 4,587,976, Cl. 128-699.000.

Schmid, Walter, to Robert Bosch GmbH. Fuel injection pump for internal combustion engines. 4,587,940, Cl. 123-503.000.

Schmidt, Donald L.; Meyer, Louis W.; and Urchick, Demetrius, to Dow Chemical Company, The. Perfluorocarbon polymeric coatings having low critical surface tensions. 4,588,643, Cl. 428-422.000.

Schmidt, Manfred, to Agfa-Gevaert Aktiengesellschaft. Cassette for photosensitive material with magnetic members. 4,589,125, Cl. 378-187.000.

Schmidt, Robert L.: *See—*
Haskell, Barin G.; and Schmidt, Robert L., 4,589,018, Cl. 358-142.000.

Schmitt, Hans-Georg; Lurssen, Klaus; and Wedemeyer, Karlfried, to Bayer Aktiengesellschaft. Phenoxymethane derivatives for regulating plant growth. 4,588,433, Cl. 71-98.000.

Schmitz, Gunther; Greulich, Bodo; and Kettenring, Gerhard, to TRW United-Carr GmbH. Sealing plug. 4,588,105, Cl. 220-359.000.

Schmoke, Julian M., Jr.: *See—*
Wedam, Werner F.; Babcock, William E.; and Schmoke, Julian M., Jr., 4,588,929, Cl. 315-395.000.

Schmolka, Irving R., to BASF Corporation. Methods and compositions for intravaginal contraception. 4,588,581, Cl. 424-45.000.

Schnapauff, Rudolf: *See—*
Peternell, Hans; and Schnapauff, Rudolf, 4,589,058, Cl. 361-433.000.

Schneider, Franz: *See—*
Wenz, Herbert; and Schneider, Franz, 4,587,915, Cl. 112-275.000.

Schnoes, Heinrich K.: *See—*
DeLuca, Hector F.; and Schnoes, Heinrich K., 4,588,716, Cl. 514-168.000.

Schoenberg, Jules E.; Flanagan, Thomas P.; and Ray-Chaudhuri, Dilip K., to National Starch and Chemical Corporation. Hot-melt adhesives based on vinyl polymer and process for adhering surfaces therewith. 4,588,767, Cl. 524-272.000.

Scholl, Thomas; Preuss, Reinhard; Lachmann, Burkhard; Lower, Hartmut; and Muller, Peter R., to Bayer Aktiengesellschaft. Benzylidenemalonic or vinylogous benzylidenemalonic acid polyesters, their preparation and their use for the UV stabilization of thermoplastics. 4,588,807, Cl. 528-272.000.

Schott Glaswerke: *See—*
Kiefer, Werner; and Sura, Maria, 4,588,540, Cl. 264-43.000.

Schott, Lawrence A. Combustion heater. 4,587,949, Cl. 126-117.000.

Schotten, Theodor, to Neubauer GmbH, Mashinenbau, Firma. Passive leg exercise apparatus. 4,587,960, Cl. 128-25.00R.

Schroder, Gunther; and Singer, Robert, to BBC Brown, Boveri & Co., Ltd. Process for the manufacture of a workpiece from a creep-resistant alloy. 4,588,552, Cl. 419-19.000.

Schroer, Walter: *See—*
Thoma, Wilhelm; Pedain, Josef; Schroer, Walter; and Kling, Waldemar, 4,588,761, Cl. 524-38.000.

Schuh, Stephen E.; and Smoot, Maria R., to Procter & Gamble Company, The. Granular automatic dishwasher detergent compositions containing smectite clay. 4,588,515, Cl. 252-99.000.

Schulte-Elte, Karl-Heinrich, to Firmenich SA. Process for the preparation of an isomeric mixture of 1-(2,6,6-trimethylcyclohexyl)-hexan-3-ol. 4,588,849, Cl. 568-834.000.

Schulte, Heinz, to Mannesmann Rexroth GmbH. Hydraulic pressure-relief valve. 4,587,988, Cl. 137-110.000.

Schulte, Rudolf R.; East, Gary P.; and Heindle, Alfons, to Pudenz-Schulte Medical Research Corp. Infusion reservoir and pump system. 4,588,394, Cl. 604-9.000.

Schultz, Dennis B. Sleeping bag. 4,587,682, Cl. 5-413.000.

Schultze, Lawrence E.; Bauer, Donald J.; and Arington, Ronald M., to United States of America, Interior. Separation of lithium chloride from impurities. 4,588,565, Cl. 423-179.500.

Schupphaus, Herbert, to Gebr. Eickhoff Maschinenfabrik und Eisengiesserei m.b.H. Control for mining machine. 4,588,230, Cl. 299-1.000.

Schwab, Alfred: *See—*
Suh, John T.; Skiles, Jerry W.; Williams, Bruce E.; and Schwab, Alfred, 4,588,734, Cl. 514-311.000.

Schwaha, Karl: *See—*
Waltl, Josef; Granitz, Fritz; and Schwaha, Karl, 4,588,020, Cl. 164-454.000.

Schwartz, Lawrence; and Steele, Jerry T., to Flight Connector Corporation. Self-locking coupling nut. 4,588,245, Cl. 339-89.00R.

Schwartz, Lenore F. Cleaning liquid and process of using same. 4,588,516, Cl. 252-174.210.

Schwartz, Robert A.: *See—*
Duchesneau, Jerome G.; and Schwartz, Robert A., 4,588,354, Cl. 416-27.000.

Schwarz, Hans-Helmut: *See—*
Kadelka, Jurgen; and Schwarz, Hans-Helmut, 4,588,833, Cl. 560-145.000.

Schwarz, Henning: *See—*
Reich, Joachim; and Schwarz, Henning, 4,588,908, Cl. 307-475.000.

Schwarzmeier, Karl: *See—*
Buhler, Eugen; Strobel, Klaus; and Schwarzmeier, Karl, 4,588,368, Cl. 425-546.000.

Schwenke, Derek: *See—*
Bishop, Robert; and Schwenke, Derek, 4,589,140, Cl. 382-8.000.

SCM Corporation: *See—*
Nadkarni, Anil V.; and Samal, Prasanna K., 4,588,870, Cl. 219-119.000.
Perkins, Douglas W.; and Petricca, Anthony V., 4,588,612, Cl. 427-213.000.
Suderman, Darrel R., 4,588,600, Cl. 426-555.000.

Scoggins, Lacey E.; and Senatore, Guy, to Phillips Petroleum Company. Method for the crystallization of poly(arylene sulfide). 4,588,789, Cl. 525-537.000.

Scuro, Samuel J., to United States of America, Navy. Method for making a high current fiber brush collector. 4,587,723, Cl. 29-597.000.

Seco Tools AB: *See—*
Gustafson, Manfred W., 4,588,333, Cl. 407-117.000.

Seefert, Kenneth F. Modular rock replacing drain field apparatus. 4,588,325, Cl. 405-46.000.

Seetru Ltd.: *See—*
Varga, Otto H., 4,587,845, Cl. 73-325.000.

Seifert, Dieter: *See—*
Bildl, Erich; Dietl, Josef; Baueregger, Rolf; and Seifert, Dieter, 4,588,571, Cl. 423-348.000.

Seigenji, Kiyoshi: *See—*
Hoda, Takeo; Taniguchi, Nobuyuki; and Seigenji, Kiyoshi, 4,588,272, Cl. 354-21.000.

Seisma AG.: *See—*
Staudacher, Konrad, 4,587,779, Cl. 52-167.000.

Seki, Masaki: *See—*
Kishi, Hajimu; and Seki, Masaki, 4,589,062, Cl. 364-168.000.

Sekiguchi, Takeshi: *See—*
Nakata, Kazuo; Hosoya, Jun; Ohshima, Shigeru; and Sekiguchi, Takeshi, 4,589,015, Cl. 358-55.000.

Self, Henry L., to United States of America, Navy. High security internal locking system. 4,587,817, Cl. 70-427.000.

Semiconductor Energy Laboratory Co., Ltd.: *See—*
Yamazaki, Shunpei, 4,588,610, Cl. 427-54.100.

Senatore, Guy: *See—*
Scoggins, Lacey E.; and Senatore, Guy, 4,588,789, Cl. 525-537.000.

Senda, Minji: *See—*
Chiba, Takashi; Koga, Satoru; and Senda, Minji, 4,589,064, Cl. 364-200.000.

Seng, Stephen: *See—*
Dunn, Charles S.; and Seng, Stephen, 4,589,119, Cl. 373-94.000.
Hohman, Charles M.; Propster, Mark A.; and Seng, Stephen, 4,588,429, Cl. 65-27.000.

Senn, Patrice. Double integration, delta-sigma, analog-digital coder. 4,588,981, Cl. 340-347.0AD.

Sercus, Owen H. Color-changing dyed product and process. 4,588,409, Cl. 8-403.000.

Seto, Tadao; and Shimazaki, Yoshikazu, to Fuji Kagakushi Kogyo Co., Ltd. Heat-sensitive color transfer recording media and printing process using the same. 4,588,315, Cl. 400-120.000.

Sevastakis, Gus. Continuous casting apparatus. 4,588,016, Cl. 164-425.000.

Seyfried, Philippe: *See—*
Auchapt, Pierre; Sablier, Robert; Symard, Jose ; and Seyfried, Philippe, 4,588,524, Cl. 252-626.000.

Seymour, Stephen R., to Rolls-Royce Limited. Apparatus for processing of pyrometer signals. 4,588,954, Cl. 328-151.000.

Shadbolt, Colin F.: *See—*
Ullman, Thomas J.; Shadbolt, Colin F.; Pagdin, Brian C.; Marriage, David J.; Clarke, Peter J.; and Sheppard, Ian J., 4,587,986, Cl. 137-1.000.

Shadzi, Bahram, to Magnetic Peripherals Inc. Disk stripping and coating process. 4,588,611, Cl. 427-129.000.

Shah, Bakul V.; and Maskevitch, James A., to Fortune Systems Corporation. Data processing system having automatic configuration. 4,589,063, Cl. 364-200.000.

Shanks, Thomas P., to Hudson Oxygen Therapy Sales Company. Nebulizer. 4,588,129, Cl. 239-338.000.

Sharp Kabushiki Kaisha: *See—*
Itoh, Hiromu; Tani, Zempei; and Hachimura, Kenji, 4,588,936, Cl. 318-594.000.
Torimaru, Yasuo; and Yoshimura, Masahiro, 4,589,029, Cl. 358-224.000.

Shaw, Herbert J.: *See—*
Tur, Moshe; Goodman, Joseph W.; Shaw, Herbert J.; Moslehi, Behzad; and Bowers, John E., 4,588,255, Cl. 350-96.160.

Shaw, Terrence M., to Cummins Engine Company, Inc. Cylinder block for internal combustion engine. 4,587,933, Cl. 123-41.670.

Sheehan, Joseph F.: *See—*
Berman, Irwin; and Sheehan, Joseph F., 4,587,904, Cl. 102-333.000.

Sheiman, David M., to Bright & Morning Star Company, a limited partnership. Stereoscopic optical system. 4,588,259, Cl. 350-132.000.

Shell Oil Company: *See—*
Gilchrist, Robert T., Jr., 4,588,329, Cl. 405-283.000.
Langner, Carl G., 4,588,326, Cl. 405-169.000.
McCullough, J. Douglas, Jr., 4,588,775, Cl. 525-88.000.

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Otis, Bradley A., 4,587,856, Cl. 73-863.510.
Powell, James E., 4,588,821, Cl. 549-397.000.

Shepherd, Lawrence H., Jr.; DeWitt, William J.; and Kuehnhanss, Gerhard O., to Ethyl Corporation. Chemical composition. 4,588,534, Cl. 260-513.00R.

Sheppard, Ian J.: *See—*
Ullman, Thomas J.; Shadbolt, Colin F.; Pagdin, Brian C.; Marriage, David J.; Clarke, Peter J.; and Sheppard, Ian J., 4,587,986, Cl. 137-1.000.

Sherwood Medical Company: *See—*
Flynn, Daniel P.; and Ranford, Alan B., 4,588,160, Cl. 251-10.000.

Sheth, Bhogilal B.; Gilbert, Sheri A.; and Kinsel, Jane F., to Richardson-Vicks Inc. Antidiarrheal compositions and use thereof. 4,588,589, Cl. 424-195.100.

Shiba, Kenji, to Minolta Camera Kabushiki Kaisha. Fixed-star projecting machine for planetarium. 4,588,384, Cl. 434-286.000.

Shibahata, Yasuji: *See—*
Uno, Takaaki; Shibahata, Yasuji; and Tsubota, Yasumasa, 4,588,039, Cl. 180-140.000.

Shibata, Kazuhiko: *See—*
Miki, Nobuaki; Nakamura, Shinya; and Shibata, Kazuhiko, 4,588,059, Cl. 192-3.280.

Shibata, Masaru: *See—*
Noguchi, Yasuo; and Shibata, Masaru, 4,587,958, Cl. 128-24.00A.

Shibata, Tomoyuki; and Nakayama, Mitsuhito, to Ebara Corporation. Submersible pump. 4,588,353, Cl. 415-197.000.

Shibayama, Takashi; and Sugano, Kazuhiko, to Nissan Motor Co., Ltd. Shift valve for automatic transmission. 4,587,887, Cl. 91-469.000.

Shibuya, Kiyoshi: *See—*
Ayano, Mitsutoshi; Shibuya, Kiyoshi; Itou, Shin-ichi; Takatou, Kenji; and Tojo, Toshiro, 4,588,860, Cl. 179-77.000.

Shiley Incorporated: *See—*
Nebergall, Perry A.; and French, Robert C., 4,588,399, Cl. 604-280.000.

Shimada, Masaaki: *See—*
Saitoh, Shigeru; Shimada, Masaaki; and Imura, Takeshi, 4,588,562, Cl. 422-245.000.

Shimadzu Corporation: *See—*
Komoto, Akira; and Nishio, Akira, 4,587,853, Cl. 73-862.590.

Shimalla, Charles J., to Chicopee. Apertured fusible fabrics. 4,588,630, Cl. 428-131.000.

Shimamoto, Mamoru: *See—*
Kaneiwa, Toshiyuki; and Shimamoto, Mamoru, 4,588,935, Cl. 318-483.000.

Shimamura, Norio: *See—*
Endo, Keizo; Matsumura, Hiroshi; Shimamura, Norio; and Kawabe, Masaru, 4,589,069, Cl. 364-405.000.

Shimazaki, Yoshikazu: *See—*
Seto, Tadao; and Shimazaki, Yoshikazu, 4,588,315, Cl. 400-120.000.

Shimizu, Isao, to Hitachi, Ltd. Method of fabricating a semiconductor device. 4,588,472, Cl. 156-628.000.

Shimizu, Shinichi; Rikiishi, Tetuo; and Koyama, Yasuo, to Saitama Bee-Keeping Co., Ltd. Method of treating pollen for pulverization thereof and extraction of essence therefrom. 4,588,134, Cl. 241-21.000.

Shimizu, Takashi: *See—*
Kohno, Hiroshi; Asao, Haruhiko; Kuwabara, Masao; and Shimizu, Takashi, 4,588,564, Cl. 423-87.000.

Shimizu, Toshio; Satoo, Takanori; Doi, Ryota; Yamaguchi, Motoo; Tsukui, Tsutomu; and Yoshioka, Yoshio, to Hitachi, Ltd. Fuel cell. 4,588,660, Cl. 429-35.000.

Shimizu, Yoh; and Nishide, Teruyuki, to Kawasaki Steel Corporation. Method of manufacturing grain-oriented silicon steel sheets. 4,588,453, Cl. 148-111.000.

Shimizu, Yoshiki: *See—*
Ohmori, Akira; Tomihashi, Nobuyuki; and Shimizu, Yoshiki, 4,588,781, Cl. 525-200.000.

Shimizu, Yoshiyuki, to Nippon Kogaku K. K. Microscope objective lens. 4,588,264, Cl. 350-414.000.

Shimpo Kogyo Kabushiki Kaisha: *See—*
Yamada, Yoji; Matsuura, Michinori; and Kakeshita, Yoshiaki, 4,587,855, Cl. 73-862.480.

Shin-Etsu Chemical Co., Ltd.: *See—*
Ishihara, Toshinobu; Yamamoto, Akira; and Takamizawa, Minoru, 4,588,832, Cl. 556-478.000.

Shinagawa, Yukio: *See—*
Kataoka, Shinzi; Shinagawa, Yukio; and Sakaguchi, Shinji, 4,588,673, Cl. 430-264.000.

Shinkawa, Keiro: *See—*
Noda, Masaki; Shinkawa, Keiro; Saitoh, Takeshi; Hatashita, Hiroshi; and Matsuura, Shigeo, 4,589,016, Cl. 358-118.000.

Shinmura, Tetsuro; and Kinoshita, Tutomu, to Nippondenso Co., Ltd. D.C. brushless motor with an improved yoke. 4,588,912, Cl. 310-68.00R.

Shiomura, Yasuro: *See—*
Ogawa, Masaki; and Shiomura, Yasuro, 4,588,645, Cl. 428-447.000.

Shiono, Ryuji: *See—*
Sato, Joichi; Shiono, Ryuji; Niimura, Tsutomu; Isogawa, Toshiaki; and Sato, Mitsuru, 4,589,021, Cl. 358-164.000.

Shira, Jerry P.: *See—*
Miutel, Alexander; and Shira, Jerry P., 4,588,753, Cl. 521-86.000.

Shirahata, Ryuji; Yanai, Akio; and Kitamoto, Tatsuji, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,588,636, Cl. 428-336.000.

Shirahata, Ryuji: *See—*
Kitamoto, Tatsuji; Shirahata, Ryuji; Yamada, Yasuyuki; and Akashi, Goro, 4,588,656, Cl. 428-694.000.

Shockley, Richard D.: *See—*
Magee, Arthur W.; Shockley, Richard D.; and Crawford, Michael E., 4,588,460, Cl. 156-96.000.

Shoda, Mikio; Oka, Masahiko; and Nishida, Masami, to Dainippon Screen Mfg. Co., Ltd. Transfer device of sheet object. 4,588,185, Cl. 271-267.000.

Shoemaker, James E.; and Younger, Gilbert M., to A. Lakin & Sons, Inc. Motor shaft bearing support and disconnect. 4,588,322, Cl. 403-1.000.

Shohet, Juda L.: *See—*
Ghaderi, Sahba; Shohet, Juda L.; and Littlejohn, Duane P., 4,588,888, Cl. 250-291.000.

Short, W. Harry, to Rogers Corporation. Cooling and power and/or ground distribution system for integrated circuits. 4,589,057, Cl. 361-386.000.

Showa Aluminum Corporation: *See—*
Imai, Takaichi; Yamada, Takeshi; Sakaue, Kunio; Isoyama, Eizo; Mizoguchi, Masaaki; and Tanaka, Katsumi, 4,588,025, Cl. 165-133.000.
Munekawa, Masaaki, 4,588,023, Cl. 165-104.330.

Shubow, Calvin. Bearing wall and joint construction. 4,587,782, Cl. 52-251.000.

Shuto, Katsuichi: *See—*
Teranishi, Masayuki; Murakata, Chikara; Matsukuma, Ikuo; Shuto, Katsuichi; and Ichikawa, Shunji, 4,588,729, Cl. 514-263.000.

Si-Jet Limited: *See—*
Flanagan, Raymond, 4,587,985, Cl. 134-169.00R.

Siedle, Allen R.: *See—*
Palensky, Frederick J.; and Siedle, Allen R., 4,588,800, Cl. 528-15.000.

Siegfried Frei: *See—*
Frei, Siegfried; and Hohl, Ernst, 4,588,605, Cl. 427-28.000.

Siegmund, Walter P., to Warner-Lambert Technologies, Inc. Searching and measuring endoscope. 4,588,294, Cl. 356-241.000.

Siemens Aktiengesellschaft: *See—*
Beifuss, Wolfgang; Haussmann, Bernd; Pomper, Michael; and Soutschek, Ewald, 4,589,086, Cl. 364-760.000.
Depta, Ingolf; and Kindler, Wilfried, 4,588,999, Cl. 346-140.00R.
Koch, Rudolf; and Herbst, Heiner, 4,589,024, Cl. 358-213.000.
Meyer, Willibald; and Warwersig, Jurgen, 4,588,907, Cl. 307-441.000.
Roloff, Herbert F.; and Kollner, Hartwig W., 4,588,975, Cl. 338-5.000.
Sigusch, Reiner; and Wipper, Ludwig, 4,588,379, Cl. 432-231.000.
Westermeier, Heinz, 4,589,116, Cl. 372-36.000.

Sietmann, Vernon H.: *See—*
Brockhaus, Donald B.; Fuehrer, Calvin L.; Swartz, Walter E.; and Sietmann, Vernon H., 4,587,893, Cl. 98-55.000.

SIG Schweizerische Industrie-Gesellschaft: *See—*
Kopp, Georg, 4,587,794, Cl. 53-550.000.

Sigler, David R., to General Motors Corporation. Oxide whisker growth on contaminated aluminum-containing stainless steel foil. 4,588,449, Cl. 148-6.350.

Signode Corporation: *See—*
Van Erden, Donald L.; and Ausnit, Steven, 4,589,145, Cl. 383-5.000.

Sigusch, Reiner; and Wipper, Ludwig, to Siemens Aktiengesellschaft. Configuration for temperature treatment of substrates, in particular semi-conductor crystal wafers. 4,588,379, Cl. 432-231.000.

Silay, Louis E.; Stein, James S.; and Kunzweiler, John J., to Concrete Safety Equipment, Inc. Pavement surfacing machine. 4,588,231, Cl. 299-39.000.

Simoneau, Raynald, to Hydro Quebec. Co containing austenitic stainless steel with high cavitation erosion resistance. 4,588,440, Cl. 75-126.00B.

Simpson, Dennis L.: *See—*
Brabb, James D.; and Simpson, Dennis L., 4,588,133, Cl. 239-681.000.

Singer, Arnold M.: *See—*
Oliver, John E.; and Singer, Arnold M., 4,588,445, Cl. 134-22.140.
Oliver, John E., Jr.; and Singer, Arnold M., 4,588,031, Cl. 166-291.000.

Singer Company, The: *See—*
Peters, David L., 4,588,382, Cl. 434-44.000.

Singer, Robert: *See—*
Schroder, Gunther; and Singer, Robert, 4,588,552, Cl. 419-19.000.

Sinha, Uday K.; and Peacock, Frank A., to Southwire Company. Control in continuous casting to enhance feeding. 4,588,018, Cl. 164-413.000.

SITMA Societa Italiana Macchine Automatiche S.p.A.: *See—*
Ballestrazzi, Aris; and Tassi, Lamberto, 4,588,180, Cl. 271-5.000.

Sjogren, Kaj; and Brosh, James, to ESCO Corporation. Wear cap style excavating tooth. 4,587,751, Cl. 37-142.00R.

SKF Steel Engineering, AB: *See—*
Eriksson, Sune; and Bjorling, Gotthard, 4,588,436, Cl. 75-10.00R.

Skiles, Jerry W.: *See—*
Suh, John T.; Skiles, Jerry W.; Williams, Bruce E.; and Schwab, Alfred, 4,588,734, Cl. 514-311.000.

Sliker, James A. Duplicator attachment for woodturning lathes. 4,588,005, Cl. 142-7.000.

Smearing, Robert W., to General Electric Company. Modified polyetherimide resins. 4,588,779, Cl. 525-180.000.

Smith, David A., to Dow Chemical Company, The. Bag transfer device. 4,588,070, Cl. 198-468.300.

Smith, Edward F., III: *See—*
Haque, Reza; and Smith, Edward F., III, 4,588,641, Cl. 428-413.000.

Smith International, Inc.: *See—*
Uyehara, Hajime; and Nimmagadda, Rao R., 4,588,309, Cl. 384-94.000.

Smith, James, to U.S. Philips Corporation. Display tube and an electron beam deflector therefor. 4,588,920, Cl. 313-422.000.

Smith, Nathan R., to InTest Corporation. Positioner for maintaining an object in a substantially weightless condition. 4,588,346, Cl. 414-673.000.

Smith & Wesson Chemical Company, Inc.: *See—*
Litman, Alan, 4,588,116, Cl. 224-253.000.

SmithKline Beckman Corporation: *See—*
Gallagher, Gregory, Jr., 4,588,740, Cl. 514-418.000.

Smoot, Maria R.: *See—*
Schuh, Stephen E.; and Smoot, Maria R., 4,588,515, Cl. 252-99.000.

SMS Schloemann-Siemag Aktiengesellschaft: *See—*
Bohmer, Friedhelm, 4,587,820, Cl. 72-78.000.

Snider, Harold F., to Thermo-O-Disc Incorporated. Fiber optics condition sensor and method of making same. 4,588,886, Cl. 250-227.000.

Societa Italiana Vetro SIV S.p.A.: *See—*
Leone, Massimo; and Torre, Francesco, 4,587,764, Cl. 51-33.00W.

Societe Anonyme D.B.A.: *See—*
Carre, Jean-Jacques; and Levrai, Roland, 4,588,363, Cl. 418-201.000.
Courbot, Pierre, 4,588,052, Cl. 188-79.50P.
Mery, Jean-Claude, 4,588,051, Cl. 188-73.320.

Societe Anonyme de Telecommunications: *See—*
Missout, Bernard M.; Michaux, Jean-Pierre; and Piova, Jean-Luc, 4,587,801, Cl. 57-6.000.

Societe de Fabrication d'Instruments de Mesure: *See—*
Audren, Jean-Thierry, 4,587,860, Cl. 74-5.00F.

Societe Francais des Produits pour Catalyse Pro-Catalyse chez Institut Francais du Petrole: *See—*
Blanchard, Gilbert; and Franck, Jean-Pierre, 4,588,497, Cl. 208-138.000.

Societe Industrielle de Liaisons Electriques: *See—*
Missout, Bernard M.; Michaux, Jean-Pierre; and Piova, Jean-Luc, 4,587,801, Cl. 57-6.000.

Societe Nouvelle Transfix: *See—*
Beisser, Jean-Claude, 4,588,971, Cl. 336-5.000.

Sogah, Dotsevi Y.: *See—*
Dicker, Ira B.; Farnham, William B.; Hertler, Walter R.; Laganis, Evan D.; Sogah, Dotsevi Y.; Del Pesco, Thomas W.; and Fitzgerald, Patrick H., 4,588,795, Cl. 526-192.000.

Solex (U.K.) Limited: *See—*
Ullman, Thomas J.; Shadbolt, Colin F.; Pagdin, Brian C.; Marriage, David J.; Clarke, Peter J.; and Sheppard, Ian J., 4,587,986, Cl. 137-1.000.

Sommer, David L.: *See—*
Thomas, Teddy R.; Sommer, David L.; and Von Bokern, Greg J., 4,589,074, Cl. 364-483.000.

Songer, Jimmie D., to High Resolution Televison, Inc. High resolution television. 4,589,012, Cl. 358-12.000.

Sonia, Martinis Marchi Jellicich Maria, administrator: *See—*
Felder, Ernst; and Zingales, Maria, deceased, 4,588,574, Cl. 423-554.000.

Sonoda, Hirotetsu: *See—*
Masuda, Naosuke; and Sonoda, Hirotetsu, 4,587,886, Cl. 91-415.000.

Sony Corporation: *See—*
Nemoto, Tsuneo; Koizumi, Osamu; and Sugawara, Koukichi, 4,589,105, Cl. 369-291.000.
Quan, Ronald, 4,588,909, Cl. 307-491.000.
Sato, Joichi; Shiono, Ryuji; Niimura, Tsutomu; Isogawa, Toshiaki; and Sato, Mitsuru, 4,589,021, Cl. 358-164.000.
Sumiyoshi, Hiroji; Maeda, Makoto; and Aoki, Takashi, 4,588,430, Cl. 65-56.000.

Sooch, Navdeep S.: *See—*
Kerth, Donald A.; and Sooch, Navdeep S., 4,588,941, Cl. 323-314.000.

Soroczak, Myra M.: *See—*
Mair, Alexander D.; and Soroczak, Myra M., 4,588,498, Cl. 209-9.000.

Souriau & C.: *See—*
Grappe, Rene ; and Martin, Pascal, 4,588,247, Cl. 339-94.00M.

Southern Can Company: *See—*
Ruegg, Josef N., 4,588,101, Cl. 220-89.00A.

Southwest Pump Company: *See—*
Pope, Woodrow W., 4,589,077, Cl. 364-509.000.

Southwick, Everett W.: *See—*
Houminer, Yoram; Southwick, Everett W.; and Williams, David L., 4,588,813, Cl. 544-406.000.

Southwire Company: *See—*
Sinha, Uday K.; and Peacock, Frank A., 4,588,018, Cl. 164-413.000.

Soutschek, Ewald: *See—*
Beifuss, Wolfgang; Haussmann, Bernd; Pomper, Michael; and Soutschek, Ewald, 4,589,086, Cl. 364-760.000.

Spatz, David M., to Chevron Research Company. Fungicidal (trihalophenoxy or trihalophenthio) alkylaminoalkyl pyridines and pyrroles. 4,588,735, Cl. 514-357.000.

Speakman, Eugene R., to McDonnell Douglas Corporation. Staking system. 4,587,833, Cl. 72-465.000.

Spector, George: *See—*
Palet, Timothy J.; and Spector, George, 4,588,042, Cl. 181-153.000.
Stellato, Antonio J.; and Spector, George, 4,588,165, Cl. 254-8.00B.
Yanz, Rudolph A., Jr.; and Spector, George, 4,588,089, Cl. 206-581.000.

Speiser, Carl T.: *See—*
Baumann, Hans-Peter; Speiser, Carl T.; and Weisskopf, Ernst, 4,588,448, Cl. 148-6.270.

Spencer, Harvey J., to Paper Converting Machine Company. Web winding machine. 4,588,138, Cl. 242-64.000.

Sperry Corporation: *See—*
Hurlburt, Joseph C., 4,587,890, Cl. 98-2.110.
Rothenberger, Roland D., 4,588,944, Cl. 324-73.00R.

Spietschka, Ernst; and Urban, Manfred, to Hoechst Aktiengesellschaft. Process for the preparation of 3,4,9,10-perylenetetracarboxylic acid diimide. 4,588,814, Cl. 546-37.000.

Spinelli, Richard A., to Xerox Corporation. Full-frame illumination and imaging system. 4,588,287, Cl. 355-46.000.

Spinning, Richard R. Adjustable radial curve radius setting scale. 4,587,740, Cl. 33-177.000.

Spiridonov, Oleg P.: *See—*
Fedorov, Svyatoslav N.; Egorova, Eleonora V.; Spiridonov, Oleg P.; Nanushian, Sergei R.; Benenson, Igor L.; Degtev, Evgeny I.; Masterov, Vyacheslav N.; and Kiselev, Vladimir G., 4,588,406, Cl. 623-6.000.

Sposito, Richard G.: *See—*
Prather, Donald W.; and Sposito, Richard G., 4,589,106, Cl. 370-58.000.

Sprafke, Uwe, to Wegmann & Co. GmbH. Hatch for a combat vehicle, especially an armored vehicle. 4,587,880, Cl. 89-36.140.

Sprague Electric Company: *See—*
Nguyen, Trung H.; and Hutchins, Clinton E., 4,588,486, Cl. 204-129.430.

Sprenger, Gregory S.; and Knight, Noel E., to Kaydon Corporation. Fuel filter and dehydrator. 4,588,500, Cl. 210-100.000.

Spuck, Gisbert; and Ludwig, Gerhard, to Cito-Pac Verpackungsgesellschaft mbH. Blister pack strip. 4,588,090, Cl. 206-532.000.

SS Pharmaceutical Co., Ltd.: *See—*
Oono, Junji; Yano, Kenichi; Sato, Junichi; Kouda, Tadayuki; Ogawa, Yoichiro; Yokoi, Kouichi; and Nakashima, Toshiaki, 4,588,822, Cl. 549-417.000.

Staar S.A.: *See—*
Schatteman, Etienne A. M.; and Denis, Philippe V., 4,589,101, Cl. 369-38.000.

Stablein, Bruno: *See—*
Reinlein, Karl-Heinz: and Stablein, Bruno, 4,587,924, Cl. 118-70.000.

Stadler, Istvan: *See—*
Gyory, Peter; Galambos, Geza; Kanay, Karoly; Ivanics, Jozsef; Dorman, Gyorgy; Kovacs, Gabor; Stadler, Istvan; Virag, Sandor; Tomoskozi, Istvan; Kormoczky, Peter; and Kovacs, Marianna, 4,588,713, Cl. 514-63.000.

Staempfli, Jackie, to Tulcea, S.A. Percussion device. 4,587,733, Cl. 30-278.000.

Staffeld, Stanley E. Creaser tool. 4,587,736, Cl. 30-292.000.

Stain, Donald B.: *See—*
Worthington, Ralph E.; Magdics, Alex; and Stain, Donald B., 4,588,573, Cl. 423-552.000.

Stallard, Loyal N.: *See—*
Cutler, John H.; and Stallard, Loyal N., 4,589,050, Cl. 361-86.000.

Standard Oil Company, The: *See—*
Curatolo, Benedict S.; and Coffey, Gerald P., 4,588,797, Cl. 526-225.000.

Standard-Thomson Corporation: *See—*
Duprez, Wayne R., 4,587,931, Cl. 123-41.150.

Standex International Corporation: *See—*
Hill, John, 4,588,974, Cl. 336-192.000.
Story, Ray A.; and Elrod, Granville P., 4,588,096, Cl. 211-126.000.

Stark, Robert G., Jr.: *See—*
Stark, Robert G., Sr.; Stark, Robert G., Jr.; Ellis, Janet S.; and Stark, Tom, 4,588,106, Cl. 220-414.000.

Stark, Robert G., Sr.; Stark, Robert G., Jr.; Ellis, Janet S.; and Stark, Tom. Fiberglass molded pressure vessel and method of making same. 4,588,106, Cl. 220-414.000.

Stark, Tom: *See—*
Stark, Robert G., Sr.; Stark, Robert G., Jr.; Ellis, Janet S.; and Stark, Tom, 4,588,106, Cl. 220-414.000.

Staudacher, Konrad, to Seisma AG. System for protecting a body from motions transmitted through the ground. 4,587,779, Cl. 52-167.000.

Stauffer Chemical Company: *See—*
Haag, William G.; and Chavdarian, Charles G., 4,588,714, Cl. 514-114.000.

Steele, Jerry T.: *See—*
Schwartz, Lawrence; and Steele, Jerry T., 4,588,245, Cl. 339-89.00R.

Stefani, Michael H.: *See—*
Ruck, George E.; and Stefani, Michael H., 4,587,705, Cl. 29-450.000.

Stegner, Daniel E.: *See—*
McGraw, William E.; and Stegner, Daniel E., 4,588,357, Cl. 417-34.000.

Steidle, Daniel L.; and Steidle, Patrick J. Target device with remote resetting means. 4,588,194, Cl. 273-391.000.

Steidle, Patrick J.: *See—*
Steidle, Daniel L.; and Steidle, Patrick J., 4,588,194, Cl. 273-391.000.

Stein, James S.: *See*—
Silay, Louis E.; Stein, James S.; and Kunzweiler, John J., 4,588,231, Cl. 299-39.000.
Steiner, Alois, to Sulzer Brothers Limited. Weft yarn control for a weaving machine rotor. 4,587,996, Cl. 139-194.000.
Steinke, Dale F., to F. Korbel and Bros. Inc. Apparatus for classifying juice squeezed from grapes. 4,587,896, Cl. 100-117.000.
Stellar Energy Systems, Inc.: *See*—
Townsend, Donald W.; and Routery, Edward E., 4,587,951, Cl. 126-438.000.
Stellato, Antonio J.; and Spector, George. Engine stand and crane. 4,588,165, Cl. 254-8.00B.
Stenberg, Johan E.: *See*—
Nygren, Bo H.; and Stenberg, Johan E., 4,588,624, Cl. 428-36.000.
Stephens, Lawrence K., to International Business Machines Corp. Display system for monitoring and alarm system. 4,588,987, Cl. 340-525.000.
Stephens, Robert K., to Applied Power Inc. Shock absorber and air spring assembly. 4,588,171, Cl. 267-64.240.
Stepien, George, Jr.: *See*—
Pagen, Charles A.; Stepien, George, Jr.; and Morris, Paul A., 4,588,634, Cl. 428-283.000.
Sternberger, Klaus: *See*—
Keil, Karl-Heinz; Engelhardt, Fritz; Greiner, Ulrich; Sternberger, Klaus; and Pelster, Manfred, 4,588,413, Cl. 8-543.000.
Stewart, Donald R. Golf club weighting device. 4,588,191, Cl. 273-194.00B.
Stewart, James R.; and Allen, Charles F., to S & N Manufacturing, Inc. Ball rebound apparatus. 4,588,190, Cl. 273-29.00A.
Stewart, Malcolm J.; Hudson, Andrew; and Griffiths, Peter W. Laser imaging materials comprising carbon black in overlayer. 4,588,674, Cl. 430-273.000.
Stewart, Roger G.; and Mazin, Moshe, to RCA Corporation. Apparatus for electrically joining the ends of substantially parallel semiconductor lines. 4,589,008, Cl. 357-45.000.
Sticht, Walter. Apparatus for singling assembly parts. 4,588,069, Cl. 198-443.000.
Stiefel, Edward I.: *See*—
Pan, Wie-Hin; and Stiefel, Edward I., 4,588,829, Cl. 556-38.000.
Stillman, Harold M.: *See*—
Parker, William S.; and Stillman, Harold M., 4,588,383, Cl. 434-265.000.
Stimmell, James B., to National Semiconductor Corporation. Tantalum silicide capacitor. 4,589,056, Cl. 361-311.000.
Stockburger, Hermann; and Winderlich, Hans-Georg. Copying apparatus with use registering means. 4,588,286, Cl. 355-40.000.
Stockhaus, Klaus: *See*—
Esser, Franz; Koppe, Herbert; Abele, Wolfgang; and Stockhaus, Klaus, 4,588,736, Cl. 514-392.000.
Stockler, Kurt: *See*—
Baur, Rupert; Dietel, Klaus; Stockler, Kurt; and Tauchert, Klaus, 4,589,143, Cl. 382-61.000.
Stokker, Gerald E., to Merck & Co., Inc. Process for epimerization at C_6 of 3,4,5,6-tetrahydro-2H-pyran-2-one. 4,588,820, Cl. 549-292.000.
Stolfi, Fred R.; Maresca, Robert L.; and Adamovic, Peter P., to North American Philips Corporation. Ultrasonic scanning apparatus. 4,587,971, Cl. 128-660.000.
Stolka, Milan; McGrane, Kathleen M.; and Facci, John S., to Xerox Corporation. Photoconductive imaging members with alkoxy amine charge transport molecules. 4,588,666, Cl. 430-59.000.
Stoll, Ilse: *See*—
Butter, Stephen A.; and Stoll, Ilse, 4,588,848, Cl. 568-885.000.
Stolle Corporation, The: *See*—
Kaminski, Elton G., 4,588,066, Cl. 198-345.000.
Stolle, Joseph W.: *See*—
Ramsey, Mark S.; and Stolle, Joseph W., 4,588,243, Cl. 339-65.000.
Stormor, Inc.: *See*—
Brockhaus, Donald B.; Fuehrer, Calvin L.; Swartz, Walter E.; and Sietmann, Vernon H., 4,587,893, Cl. 98-55.000.
Story, Ray A.; and Elrod, Granville P., to Standex International Corporation. Knock-down tray rack. 4,588,096, Cl. 211-126.000.
Streifel, Jerome A.: *See*—
Arnold, Lyle J., Jr.; and Streifel, Jerome A., 4,588,525, Cl. 260-397.400.
Streusand, Marie J., to SWS Silicones Corporation. Thermally conductive heat curable organopolysiloxane compositions. 4,588,768, Cl. 524-443.000.
Strobel, Gary A., to Research and Development Institute, Inc. at Montana State University. Development of plant roots. 4,588,693, Cl. 435-253.000.
Strobel, Klaus: *See*—
Buhler, Eugen; Strobel, Klaus; and Schwarzmeier, Karl, 4,588,368, Cl. 425-546.000.
Stroebel, Maurice G.; and Stroebel, Terryl T. Apparatus for gravity feed of liquid under constant hydrostatic pressure. 4,588,396, Cl. 604-246.000.
Stroebel, Terryl T.: *See*—
Stroebel, Maurice G.; and Stroebel, Terryl T., 4,588,396, Cl. 604-246.000.
Stromberg, Ernst A. O.: *See*—
Jonsson, Jan; and Stromberg, Ernst A. O., 4,587,734, Cl. 30-279.00R.
Strong, David W.; McGinnis, Patricia A.; Peterson, James D.; Ballmer, Steven A.; Raburn, Vern L.; Hall, Dorothy L.; and Fleck, David A., to Microsoft Corporation. Holder for storing and supporting articles. 4,588,074, Cl. 206-45.150.
Strong, Norman H., to John Fluke Mfg. Co., Inc. Instantaneous gain changing analog to digital converter. 4,588,983, Cl. 340-347.0NT.
Stroud, Raymond R.: *See*—
Fenn, Robert; and Stroud, Raymond R., 4,588,873, Cl. 219-124.340.
Studiengesellschaft Kohle mbH: *See*—
Bonnemann, Helmut, 4,588,815, Cl. 546-250.000.
Studt, William L.; Kuhla, Donald E.; and Campbell, Henry F., to William H. Rorer, Inc. Bicyclic benzenoid aminoalkylene ethers and thioethers, pharmaceutical compositions and use. 4,588,719, Cl. 514-212.000.
Stultz, Peter F.: *See*—
Liautaud, James P.; Stultz, Peter F.; and Maloney, David L., 4,588,938, Cl. 320-2.000.
Sudarsanam, Rajagopalan: *See*—
Katz, Allen; Sudarsanam, Rajagopalan; and Aubert, Donald E., 4,588,958, Cl. 330-149.000.
Suderman, Darrel R., to SCM Corporation. Dry premix composition for imparting a fried appearance to baked foods. 4,588,600, Cl. 426-555.000.
Sugano, Kazuhiko: *See*—
Shibayama, Takashi; and Sugano, Kazuhiko, 4,587,887, Cl. 91-469.000.
Sugawara, Hitosi: *See*—
Nambu, Yutaka; Sugawara, Hitosi; and Saitoh, Yasuo, 4,587,743, Cl. 34-31.000.
Sugawara, Koukichi: *See*—
Nemoto, Tsuneo; Koizumi, Osamu; and Sugawara, Koukichi, 4,589,105, Cl. 369-291.000.
Sugihara, Masanori, to Pioneer Electronic Corporation. Pinch roller actuator for tape recorder. 4,589,039, Cl. 360-90.000.
Sugita, Yutaka: *See*—
Suzuki, Ryo; Takeuchi, Teruaki; Takeshita, Masatoshi; Kodama, Naoki; and Sugita, Yutaka, 4,589,095, Cl. 365-43.000.
Takeuchi, Teruaki; Suzuki, Ryo; Kodama, Naoki; Takeshita, Masatoshi; and Sugita, Yutaka, 4,589,094, Cl. 365-36.000.
Sugiura, Eiichi. Liquid filter assembly. 4,588,503, Cl. 210-232.000.
Suh, John T.; Skiles, Jerry W.; Williams, Bruce E.; and Schwab, Alfred, to USV Pharmaceutical Corp. Blood pressure lowering n-pyridyl-, n-quinolyl-, and n-piperdyl-n-acyl amino acid derivatives and method. 4,588,734, Cl. 514-311.000.
Sukarie, George, to M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Fiber-reinforced pressure container. 4,588,622, Cl. 428-35.000.
Sukharevsky, Boris P., to Huck Manufacturing Co. Lightweight, high pressure fastener installation tool and system. 4,587,829, Cl. 72-391.000.
Sulzer Brothers Limited: *See*—
Bolleter, Ulrich; and Schaad, Werner, 4,587,995, Cl. 139-1.00R.
Steiner, Alois, 4,587,996, Cl. 139-194.000.
Sumal, Jaihind S., to Robert Bosch GmbH. Flow rate meter. 4,587,844, Cl. 73-204.000.
Sumita, Osao; Saito, Masayuki; Itou, Hisao; Kobayashi, Masahito; and Furutani, Yasumasa, to Hitachi, Ltd.; and Hitachi Engineering Co., Ltd. Method of removing oxide on metal surface. 4,588,488, Cl. 204-145.00R.
Sumitomo Bakelite Company Limited: *See*—
Noguchi, Yasuo; and Shibata, Masaru, 4,587,958, Cl. 128-24.00A.
Sumitomo Electric Industries, Ltd.: *See*—
Ogawa, Yukihiko; Kusumi, Saburo; Fukuda, Michio; Okunishi, Toshifumi; Miwa, Sinkichi; and Ohta, Yosinobu, 4,587,725, Cl. 29-753.000.
Sumitomo Rubber Industries, Ltd.: *See*—
Arimatsu, Toshio, 4,589,072, Cl. 364-473.000.
Sumiyoshi, Hiroji; Maeda, Makoto; and Aoki, Takashi, to Sony Corporation. Method of manufacturing a glass product and resulting product. 4,588,430, Cl. 65-56.000.
Sun Chemical Corporation: *See*—
Cogswell, John; and Fokos, Robert F., 4,588,393, Cl. 493-440.000.
Sun, Koushun, to Motorola, Inc. Brushless direct current motor control system with protection circuitry. 4,588,933, Cl. 318-254.000.
Sunshine, Richard B. Portable changeable lighted sign. 4,587,755, Cl. 40-571.000.
Superior Finishers, Inc.: *See*—
Charvat, Vernon K., 4,588,420, Cl. 51-298.000.
Sura, Maria: *See*—
Kiefer, Werner; and Sura, Maria, 4,588,540, Cl. 264-43.000.
Suskie, Marshall J.: *See*—
Griffith, Jonathan H.; Henriques, Everton H.; Kehoe, James L., III; and Suskie, Marshall J., 4,588,471, Cl. 156-652.000.
Sussman, Marvin L., to Cordis Corporation. Sterile air feedthrough packaging system for testing hydrocephalus shunt valves. 4,588,085, Cl. 206-438.000.
Sutherland, Douglas: *See*—
Carter, Nicholas J. R.; and Sutherland, Douglas, 4,588,864, Cl. 179-99.00H.
Sutter, Leroy V., Jr. Optical mode control for a gas laser. 4,589,114, Cl. 372-19.000.
Suyama, Sumio; and Yamamoto, Itsuo. Apparatus for high-frequency hyperthermia. 4,587,978, Cl. 128-804.000.
Suzuki, Hideaki: *See*—
Iijima, Takaaki; Nishiura, Takeshi; Inomata, Ryuji; Tanaka, Eiji; and Suzuki, Hideaki, 4,588,551, Cl. 419-2.000.
Suzuki, Nagatoshi. Apparatus for totally recycling engine exhaust gas. 4,587,807, Cl. 60-274.000.

Suzuki, Ryo; Takeuchi, Teruaki; Takeshita, Masatoshi; Kodama, Naoki; and Sugita, Yutaka, to Hitachi, Ltd. Magnetic bubble stretcher. 4,589,095, Cl. 365-43.000.

Suzuki, Ryo: *See*—
Takeuchi, Teruaki; Suzuki, Ryo; Kodama, Naoki; Takeshita, Masatoshi; and Sugita, Yutaka, 4,589,094, Cl. 365-36.000.

Suzuki, Shigeo; Kawano, Kiyoshi; Ogawa, Kimiaki; and Aoki, Harumi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Electronic camera. 4,589,023, Cl. 358-213.000.

Suzuki, Teiichi; and Izumitani, Tetsuro, to Hoya Corporation. Method of optical pumping of erbium-doped laser material and apparatus therefor. 4,589,118, Cl. 372-71.000.

Suzuki, Tomonori; and Toyohara, Makoto, to Yamaha Hatsudoki Kabushiki Kaisha; and Sanshin Kogyo Kabushiki Kaisha. Water cooled, four-cycle internal combustion engine for outboard motors. 4,588,385, Cl. 440-88.000.

Suzuki, Yasuhiko; and Ito, Hideaki, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Automobile fan control with non-periodic fluctuation signal generator. 4,588,934, Cl. 318-449.000.

Swamy, Avvari R. Exhibitor means. 4,587,752, Cl. 40-124.000.

Swan, William: *See*—
Azizi, Sohiel; and Swan, William, 4,587,703, Cl. 29-431.000.

Swartz, Walter E.: *See*—
Brockhaus, Donald B.; Fuehrer, Calvin L.; Swartz, Walter E.; and Sietmann, Vernon H., 4,587,893, Cl. 98-55.000.

Swenson, Paula S., to Neptune Corporation. Illuminated infant toy. 4,588,387, Cl. 446-130.000.

Swick, Edwin G.: *See*—
Ruehl, William E.; and Swick, Edwin G., 4,588,240, Cl. 339-19.000.

Swinbanks, Malcolm A., to National Research Development Corp. Attenuation of sound waves. 4,589,133, Cl. 381-71.000.

Swingley, Harold E., Jr., to Menasha Corporation. Fruit container. 4,588,087, Cl. 206-509.000.

Swingline, Inc.: *See*—
Olesen, Paul, 4,588,121, Cl. 227-120.000.

Swistak, Gregory B.: *See*—
Connolly, Douglas P.; Swistak, Gregory B.; and Tannascoli, Robert J., 4,587,929, Cl. 118-657.000.

Switchcraft, Inc.: *See*—
Bailey, James R.; and Long, Eric L., 4,588,854, Cl. 174-52.00R.

SWS Silicones Corporation: *See*—
Manis, Paul A.; Martin, Eugene R.; and Muntz, Ronald L., 4,588,771, Cl. 524-731.000.
Streusand, Marie J., 4,588,768, Cl. 524-443.000.

Sybron Corporation: *See*—
Mehra, Ravinder C., 4,588,095, Cl. 211-74.000.
Mehra, Ravinder C., 4,588,158, Cl. 249-64.000.

Sykes, Willard D. Wire forming machine. 4,587,821, Cl. 72-137.000.

Symard, Jose : *See*—
Auchapt, Pierre; Sablier, Robert; Symard, Jose ; and Seyfried, Philippe, 4,588,524, Cl. 252-626.000.

Syntex (U.S.A.) Inc.: *See*—
Khanna, Pyare; and Ullman, Edwin F., 4,588,697, Cl. 436-518.000.

Synthelabo: *See*—
Cavero, Icilio; and Langer, Salomon Z., 4,588,747, Cl. 514-630.000.
Kaplan, Jean-Pierre, 4,588,748, Cl. 514-641.000.

Szapacs, Edward M.: *See*—
Lange, Barry C.; and Szapacs, Edward M., 4,588,487, Cl. 204-157.820.

Szczypiorski, Wojtek S.: *See*—
Bergeron, Norman J.; Szczypiorski, Wojtek S.; Villa, James G.; and Hazelett, S. Richard, 4,588,021, Cl. 164-432.000.

Tabatch, Jack; Tabatch, Warren; and Tabatch, Shane, to Peer Group Communications Corporation. Folding game book. 4,588,210, Cl. 283-63.00R.

Tabatch, Shane: *See*—
Tabatch, Jack; Tabatch, Warren; and Tabatch, Shane, 4,588,210, Cl. 283-63.00R.

Tabatch, Warren: *See*—
Tabatch, Jack; Tabatch, Warren; and Tabatch, Shane, 4,588,210, Cl. 283-63.00R.

Tabuchi, Jyoichi: *See*—
Kono, Koichi; Mori, Shoichi; Miyasaka, Kenji; and Tabuchi, Jyoichi, 4,588,633, Cl. 428-220.000.

Tachikawa Spring Co., Ltd.: *See*—
Nemoto, Akira, 4,588,228, Cl. 297-452.000.
Sakamoto, Takao, 4,588,225, Cl. 297-346.000.

Tagoku, Izumi, to Ricoh Company, Ltd. Residual toner collecting device for electrophotographic copier. 4,588,285, Cl. 355-15.000.

Taguchi, Hirokuni: *See*—
Sawada, Takashi; Morimoto, Tomiaki; Miyoshi, Isao; Taguchi, Hirokuni; Tohmatsu, Junichi; and Kitamura, Toyohiro, 4,588,681, Cl. 435-5.000.

Tait, Robert C.: *See*—
Kado, Clarence I.; Rodriguez, Raymond L.; Froman, Byron E.; and Tait, Robert C., 4,588,689, Cl. 435-199.000.

Tajima, Osamu, to Victor Company of Japan, Limited. Tilt compensation tracking control system for optical discs. 4,589,103, Cl. 369-46.000.

Tajima, Shoji: *See*—
Kadomatsu, Yasuo; Tajima, Shoji; Miyazaki, Yoshio; Anze, Kimio; and Sakurai, Michikazu, 4,587,699, Cl. 29-121.100.

Takagi, Kazuo, to Kabushiki Kaisha Komatsu Seisakusho. Load weight measuring method. 4,588,038, Cl. 177-141.000.

Takahashi, Hiroshi: *See*—
Mishina, Hidetoshi; Takahashi, Hiroshi; Iizuka, Hisatsugu; Nakanishi, Noriyoshi; Tateno, Noriaki; and Toeda, Shigetoshi, 4,587,941, Cl. 123-550.000.

Takahashi, Hiroyuki: *See*—
Yamamoto, Takashi; Takahashi, Hiroyuki; and Awata, Satoshi, 4,588,918, Cl. 310-348.000.

Takahashi, Kiyoharu: *See*—
Matsumoto, Kunio; Kagimoto, Yoshitaka; Hirata, Tsutomu; Watanabe, Susumu; Ohtsuka, Akira; and Takahashi, Kiyoharu, 4,588,836, Cl. 562-448.000.

Takahashi, Tomowaki, to Nippon Kogaku K. K. Telecentric rear converter. 4,588,265, Cl. 350-415.000.

Takahashi, Yuji: *See*—
Ito, Yoshitoshi; Takahashi, Yuji; Ayugai, Morikazu; Mizuno, Katsuhiro; and Noguchi, Atomi, 4,589,014, Cl. 358-29.000.

Takamizawa, Minoru: *See*—
Ishihara, Toshinobu; Yamamoto, Akira; and Takamizawa, Minoru, 4,588,832, Cl. 556-478.000.

Takano, Akihiko: *See*—
Kuboki, Shigeo; Ikeda, Mitsuhiro; Takano, Akihiko; Nishio, Yoji; and Masuda, Ikuro, 4,589,007, Cl. 357-45.000.

Takano, Susumu; and Yoneda, Yoshikey, to Wako Pure Chemical Industries, Ltd. Determination of unsaturated iron-binding capacity. 4,588,695, Cl. 436-87.000.

Takashima, Hisashi: *See*—
Hirokawa, Hideo; Kazama, Seiji; and Takashima, Hisashi, 4,588,342, Cl. 414-125.000.

Takata, Junzo; Jinushi, Michio; Hashizume, Mitsuo; and Kobayashi, Mitsugu, to Takenaka Komuten Co., Ltd.; and Nankoso Company Ltd., a part interest. Heat-exchanging system for an enclosed space. 4,588,124, Cl. 237-1.00R.

Takata, Nobuharu, to Mitsubishi Denki Kabushiki Kaisha. Apparatus for detecting ground fault in variable-voltage variable-frequency power system. 4,589,046, Cl. 361-42.000.

Takata, Nobuharu, to Mitsubishi Denki Kabushiki Kaisha. Apparatus for detecting ground fault in variable-voltage variable-frequency power system. 4,589,048, Cl. 361-42.000.

Takatou, Kenji: *See*—
Ayano, Mitsutoshi; Shibuya, Kiyoshi; Itou, Shin-ichi; Takatou, Kenji; and Tojo, Toshiro, 4,588,860, Cl. 179-77.000.

Takegami, Keizo; Morita, Minoru; Nakamaru, Kazuto; and Miwa, Koji, to Tsukishima Kikai Co., Ltd.; and Mitsubishi Gas Chemical Company, Inc. Countercurrent, cooling crystallization and purification method for multi-component molten mixture. 4,588,414, Cl. 23-295.00R.

Takenaka Komuten Co., Ltd.: *See*—
Takata, Junzo; Jinushi, Michio; Hashizume, Mitsuo; and Kobayashi, Mitsugu, 4,588,124, Cl. 237-1.00R.

Takenouchi, Mutsuo: *See*—
Ozawa, Takashi; and Takenouchi, Mutsuo, 4,589,026, Cl. 358-213.000.

Takeshita, Masatoshi: *See*—
Suzuki, Ryo; Takeuchi, Teruaki; Takeshita, Masatoshi; Kodama, Naoki; and Sugita, Yutaka, 4,589,095, Cl. 365-43.000.
Takeuchi, Teruaki; Suzuki, Ryo; Kodama, Naoki; Takeshita, Masatoshi; and Sugita, Yutaka, 4,589,094, Cl. 365-36.000.

Takeuchi, Tatsuo: *See*—
Hosono, Nagao; Nagase, Yukio; Takeuchi, Tatsuo; Egami, Hidemi; and Satomura, Hiroshi, 4,589,053, Cl. 361-213.000.

Takeuchi, Teruaki; Suzuki, Ryo; Kodama, Naoki; Takeshita, Masatoshi; and Sugita, Yutaka, to Hitachi, Ltd. Magnetic bubble device. 4,589,094, Cl. 365-36.000.

Takeuchi, Teruaki: *See*—
Suzuki, Ryo; Takeuchi, Teruaki; Takeshita, Masatoshi; Kodama, Naoki; and Sugita, Yutaka, 4,589,095, Cl. 365-43.000.

Tamaki, Hiroshi, to Tokyo Kogaku Kikai Kabushiki Kaisha. Curvature measuring apparatus. 4,588,270, Cl. 351-212.000.

Tamfelt Oy AB: *See*—
Lundstrom, Kristian, 4,588,475, Cl. 162-205.000.

Tamura, Yasuyuki, to Canon Kabushiki Kaisha. Image display apparatus. 4,588,990, Cl. 340-792.000.

Tamura, Zensuke: *See*—
Ohmori, Takashi; Sato, Isao; Ishibashi, Yoji; Minakawa, Yoshimitsu; Kuroda, Michio; and Tamura, Zensuke, 4,587,809, Cl. 60-737.000.

Tanaka, Atsushi: *See*—
Horinouchi, Shigeru; and Tanaka, Atsushi, 4,587,804, Cl. 60-230.000.

Tanaka, Eiji: *See*—
Iijima, Takaaki; Nishiura, Takeshi; Inomata, Ryuji; Tanaka, Eiji; and Suzuki, Hideaki, 4,588,551, Cl. 419-2.000.

Tanaka, Hideo: *See*—
Torii, Sigeru; Tanaka, Hideo; and Akada, Mitsuo, 4,588,835, Cl. 560-254.000.

Tanaka, Katsumi: *See*—
Imai, Takaichi; Yamada, Takeshi; Sakaue, Kunio; Isoyama, Eizo; Mizoguchi, Masaaki; and Tanaka, Katsumi, 4,588,025, Cl. 165-133.000.

Tanaka, Kazunori: *See*—
Sakata, Kei; Tanaka, Kazunori; and Aiuchi, Kazunori, 4,588,181, Cl. 271-121.000.

Tanaka, Yoko: *See*—
DeLuca, Hector F.; Ikekawa, Nobuo; and Tanaka, Yoko, 4,588,528, Cl. 260-397.200.

Tanaka, Yoshikazu: *See*—
Yamamuro, Sigeaki; Abo, Keiju; Tanaka, Yoshikazu; Kumura, Haruyoshi; Hirano, Hiroyuki; and Morimoto, Yoshiro, 4,589,071, Cl. 364-424.100.

Tang, Raymond; and Hellums, Joseph M., to Hughes Aircraft Company. Continuous ferrite aperture for electronic scanning antennas. 4,588,994, Cl. 343-754.000.

Tani, Naoki; and Aiba, Kazuyuki, to Mitsubishi Denki Kabushiki Kaisha. Stator for rotating electric machine. 4,588,467, Cl. 156-294.000.

Tani, Zempei: *See*—
Itoh, Hiromu; Tani, Zempei; and Hachimura, Kenji, 4,588,936, Cl. 318-594.000.

Taniguchi, Nobuyuki: *See*—
Hoda, Takeo; Taniguchi, Nobuyuki; and Seigenji, Kiyoshi, 4,588,272, Cl. 354-21.000.

Tanino, Morihiko, to Neturen Co., Ltd. Method of starting a current-fed inverter with self-excitation. 4,589,059, Cl. 363-49.000.

Tannascoli, Robert J.: *See*—
Connolly, Douglas P.; Swistak, Gregory B.; and Tannascoli, Robert J., 4,587,929, Cl. 118-657.000.

Tanner, Lincoln L. Berry drying apparatus. 4,587,745, Cl. 34-95.000.

Tarumi, Noriyoshi: *See*—
Fukuchi, Masakazu; Kimura, Kiyoshi; Tarumi, Noriyoshi; Miwa, Tadashi; Okamoto, Yukio; and Ito, Kunio, 4,588,279, Cl. 355-3.0TR.

Tashlick, Irving; and Valenziano, Philip F., to Alva-Tech, Inc. Intumescent fire retardant compositions. 4,588,523, Cl. 252-606.000.

Taskovich, Lina T.: *See*—
Gale, Robert M.; Goetz, Victor; Lee, Eun S.; Taskovich, Lina T.; and Yum, Su I., 4,588,580, Cl. 424-21.000.

Tassi, Lamberto: *See*—
Ballestrazzi, Aris; and Tassi, Lamberto, 4,588,180, Cl. 271-5.000.

Tate, Philip E. R., to Manchem Limited. Adhesion of rubber to metals. 4,588,766, Cl. 524-176.000.

Tateno, Hiroshi: *See*—
Sakai, Shigeki; Tateno, Hiroshi; and Kataoka, Shoei, 4,589,001, Cl. 357-5.000.

Tateno, Kenichi; Yokozawa, Masami; Fujii, Hiroyuki; Nishikawa, Mikio; Katoh, Michio; and Wada, Fujio, to Matsushita Electronics Corporation. Method for manufacturing a plastic encapsulated semiconductor device and a lead frame therefor. 4,589,010, Cl. 357-70.000.

Tateno, Noriaki: *See*—
Mishina, Hidetoshi; Takahashi, Hiroshi; Iizuka, Hisatsugu; Nakanishi, Noriyoshi; Tateno, Noriaki; and Toeda, Shigetoshi, 4,587,941, Cl. 123-550.000.

Tateoka, Hitoshi: *See*—
Nakamura, Yuzo; Uchino, Fumio; Tateoka, Hitoshi; and Ishibashi, Junichi, 4,587,848, Cl. 73-632.000.

Tauchert, Klaus: *See*—
Baur, Rupert; Dietel, Klaus; Stockler, Kurt; and Tauchert, Klaus, 4,589,143, Cl. 382-61.000.

Taylor, Clarence R. Lead or pen marking device. 4,588,317, Cl. 401-131.000.

Taylor, Derek P. Embossed fabrics to give contrasting colors. 4,588,629, Cl. 428-88.000.

Taylor, Gerald G., to Grass Valley Group, Inc., The. Regulator circuit. 4,588,906, Cl. 307-270.000.

Taylor, Gregory A. Safety stirrup. 4,587,798, Cl. 54-49.000.

Taylor, Mark P.: *See*—
Brennan, John J.; Chyung, Kenneth; and Taylor, Mark P., 4,588,699, Cl. 501-9.000.

TDK Electronics Co., Ltd.: *See*—
Kobuke, Takayoshi; Izumi, Toshiaki; Saito, Seitoku; and Fukuda, Kazumasa, 4,588,654, Cl. 428-626.000.

Teich, Rudor M. Telephone intercom system. 4,588,861, Cl. 179-81.00R.

Telectronics N.V.: *See*—
Holley, Loraine K.; and Evans, Robert, 4,587,970, Cl. 128-419.0PG.

Teledyne Industries, Inc.: *See*—
Trenary, John M.; and Mammoser, Joseph G., 4,588,130, Cl. 239-381.000.

TELEFUNKEN electronic GmbH: *See*—
Krumrein, Gerhard, 4,589,049, Cl. 361-56.000.

Tennessee Valley Authority: *See*—
Mair, Alexander D.; and Soroczak, Myra M., 4,588,498, Cl. 209-9.000.

Teraguchi, Susumu: *See*—
Okonogi, Shigeo; Kawashima, Takuji; Kudo, Tsutomu; Yuguchi, Hiroya; Hiramatsu, Akinori; Teraguchi, Susumu; and Yaeshima, Tomoko, 4,588,595, Cl. 426-43.000.

Teranishi, Masayuki; Murakata, Chikara; Matsukuma, Ikuo; Shuto, Katsuichi; and Ichikawa, Shunji, to Kyowa Hakko Kogyo Co., Ltd. Treating convulsions with dihydrouracil derivatives. 4,588,729, Cl. 514-263.000.

Terry, Kenneth A.: *See*—
Ross, William A.; and Terry, Kenneth A., 4,588,996, Cl. 346-76.0PH.

Terumo Kabushiki Kaisha: *See*—
Igari, Akira; and Isono, Keinosuke, 4,588,402, Cl. 604-408.000.
Isono, Keinosuke; and Naoi, Keiji, 4,588,407, Cl. 623-11.000.

Teska, Michael A.: *See*—
Groves, William A.; Harwood, Vance R.; Fay, Thomas R.; Bingham, Elton C.; and Teska, Michael A., 4,588,945, Cl. 324-158.00R.

Texaco Inc.: *See*—
Larkin, John M., 4,588,834, Cl. 560-233.600.
Triebel, Carol A.; Darden, Jerome W.; and Peterson, Edward S., 4,588,513, Cl. 252-75.000.
Vanderpool, Steven H., 4,588,842, Cl. 564-479.000.

Texas Instruments Incorporated: *See*—
Christian, Donald J.; and Humm, Patrick A., 4,589,141, Cl. 382-14.000.
Haken, Roger A.; Alperin, Michael E.; and Lau, Chi K., 4,587,718, Cl. 29-571.000.
Laffitte, David S.; Hopkins, William D.; and Hayn, John W., II, 4,589,099, Cl. 365-230.000.
Tregilgas, John H., 4,588,446, Cl. 148-1.500.
Watts, Kevin P.; and Robinson, Jeffrey I., 4,588,858, Cl. 179-16.0AA.

Th. Goldschmidt AG: *See*—
Kollmeier, Hans-Joachim; and Schloens, Hans-Heinrich, 4,588,755, Cl. 521-112.000.

Theilacker, Klaus, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Inker for applying axially parallel stripes to a rotary printing machine. 4,587,899, Cl. 101-365.000.

Thermalloy Incorporated: *See*—
Marshall, Larry D.; and Moore, Marvin F., 4,588,028, Cl. 165-185.000.

Thermo-O-Disc Incorporated: *See*—
Snider, Harold F., 4,588,886, Cl. 250-227.000.

Thie, Werner: *See*—
Schmid, Johann J.; and Thie, Werner, 4,587,976, Cl. 128-699.000.

Thirion, Francis A.: *See*—
Davister, Armand L.; Dubreuco, Andre R.; and Thirion, Francis A., 4,588,570, Cl. 423-320.000.

Thoma, Friedrich X., to Dieter Graesslin Feinwerktechnik. Program carrier for switching chronometer systems. 4,588,304, Cl. 368-107.000.

Thoma, Martin, to MTU Motoren-und Turbinen-Union Munchen GmbH. Method of producing wear-protection layers on surfaces of structural parts of titanium or titanium-base alloys. 4,588,480, Cl. 204-37.100.

Thoma, Wilhelm; Pedain, Josef; Schroer, Walter; and Kling, Waldemar, to Bayer Aktiengesellschaft. Coating compositions containing solvents and crosslinking agents and their use for heat-activated one-coat reverse coating. 4,588,761, Cl. 524-38.000.

Thomas, Kenneth R.; and West, Neil L., to Deere & Company. Harvester machine for stripping seeds from a standing crop. 4,587,799, Cl. 56-14.600.

Thomas, Teddy R.; Sommer, David L.; and Von Bokern, Greg J., to Boeing Company, The. Multiple channel power line monitor. 4,589,074, Cl. 364-483.000.

Thompson, Donald E. Hydraulic reservoir with contamination separation. 4,587,992, Cl. 137-576.000.

Thompson, Edward, to REC, Inc. Quick wire coupling and release. 4,587,920, Cl. 114-251.000.

Thompson, Malcolm J.: *See*—
Tuan, Hsing C.; and Thompson, Malcolm J., 4,588,997, Cl. 346-76.0PH.

Thompson, William E. Windshield wiper. 4,587,686, Cl. 15-250.420.

Thomson-CSF: *See*—
Rascle, Roger; and Lange, Francois, 4,588,369, Cl. 425-437.000.
Volleau, Patrick; Bricot, Claude; Audouin, Michel; Leterme, Dominique; and Le Merer, Jean P., 4,589,102, Cl. 369-46.000.

Thomson, Michael G. R.: *See*—
Liu, Ruichen; and Thomson, Michael G. R., 4,588,928, Cl. 315-382.000.

Thoresen, Stephen L.: *See*—
Daugherty, Charles W.; Khan, Mohammad A.; Lentz, David J.; and Thoresen, Stephen L., 4,588,398, Cl. 604-265.000.

Thorson, John: *See*—
Miller, Cardell E.; Tracy, Gene A.; Engstrom, George L.; and Thorson, John, 4,588,221, Cl. 292-348.000.

Thottathil, John K., to E. R. Squibb & Sons, Inc. Process and intermediates for preparing trans-4-substituted-s-prolines. 4,588,819, Cl. 548-532.000.

Thread Technology International, Inc.: *See*—
Bollfrass, Charles A.; and Chelette, Kenneth D., 4,588,213, Cl. 285-187.000.

Three Bond Co., Ltd.: *See*—
Ozono, Masayoshi, 4,588,639, Cl. 428-402.220.

Timex Computer Corporation: *See*—
Cohen, Sam G., 4,588,856, Cl. 179-2.00C.

Tipper, Frank, to Butti Pocket Ashtray Company, Ltd. Portable cigarette holder, extinguisher and ashtray. 4,587,980, Cl. 131-235.100.

Tischer, Kurt M., to International Standard Electric Corporation. Vacuum-fluorescent display matrix and method of operating same. 4,588,921, Cl. 313-496.000.

Toa Nenryo Kogyo Kabushiki Kaisha: *See*—
Imai, Masafumi; Yamamoto, Tadashi; Furuhashi, Hiroyuki; Ueno, Hiroshi; and Inaba, Naomi, 4,588,793, Cl. 526-124.000.
Kono, Koichi; Mori, Shoichi; Miyasaka, Kenji; and Tabuchi, Jyoichi, 4,588,633, Cl. 428-220.000.

Tobita, Katsumi. Pay television receiving system. 4,589,017, Cl. 358-120.000.

Toeda, Shigetoshi: *See*—
Mishina, Hidetoshi; Takahashi, Hiroshi; Iizuka, Hisatsugu; Nakanishi, Noriyoshi; Tateno, Noriaki; and Toeda, Shigetoshi, 4,587,941, Cl. 123-550.000.

Tohmatsu, Junichi: *See*—
Sawada, Takashi; Morimoto, Tomiaki; Miyoshi, Isao; Taguchi, Hirokuni; Tohmatsu, Junichi; and Kitamura, Toyohiro, 4,588,681, Cl. 435-5.000.

Tojo, Toshiro: *See*—
Ayano, Mitsutoshi; Shibuya, Kiyoshi; Itou, Shin-ichi; Takatou, Kenji; and Tojo, Toshiro, 4,588,860, Cl. 179-77.000.

Tok Yo Ohka Kogyo Co., Ltd.: *See*—
Nakane, Hisashi; Yokota, Akira; Yabuta, Mitsuo; and Ishii, Wataru, 4,588,675, Cl. 430-325.000.

Tokai Electric Wire Co., Ltd.: *See*—
Ogawa, Yukihiko; Kusumi, Saburo; Fukuda, Michio; Okunishi, Toshifumi; Miwa, Sinkichi; and Ohta, Yosinobu, 4,587,725, Cl. 29-753.000.

Tokuhara, Mitsuhiro, to Canon Kabushiki Kaisha. Electrophotographic copying apparatus with original light detector. 4,588,283, Cl. 355-14.00E.

Tokumitsu, Yasuyuki: *See*—
Saito, Toshiyuki; Tokumitsu, Yasuyuki; Okubo, Naofumi; Daido, Yoshimasa; and Kurihara, Hiroshi, 4,588,962, Cl. 330-286.000.

Tokura, Norihito; Kawai, Hisasi; Kanehara, Kenji; and Kohama, Tokio, to Nippon Soken, Inc. Thermocouple-type gas-flow measuring apparatus. 4,587,843, Cl. 73-204.000.

Tokyo Automatic Machinery Works, Ltd.: *See*—
Yamashita, Kiyoshi, 4,587,795, Cl. 53-551.000.

Tokyo Juki Industrial Co., Ltd.: *See*—
Kinoshita, Tomoaki, 4,587,911, Cl. 112-239.000.

Tokyo Kogaku Kikai Kabushiki Kaisha: *See*—
Tamaki, Hiroshi, 4,588,270, Cl. 351-212.000.

Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Hisatomi, Kiyoshi; and Iwabuchi, Masaburo, 4,588,473, Cl. 156-645.000.
Inazaki, Koji; Nangai, Takashi; Fujimori, Yasutomo; and Kimura, Hiroichi, 4,588,297, Cl. 356-376.000.
Kojima, Tadashi, 4,588,905, Cl. 307-269.000.
Namba, Hiromi, 4,589,144, Cl. 382-61.000.
Tsuchihashi, Toshio, 4,588,041, Cl. 180-168.000.
Yasuda, Seiji; Yonezawa, Toshio; Hiraki, Shunichi; and Miyagawa, Masafumi, 4,589,004, Cl. 357-23.400.

Tokyo Shibaura Electric Co., Ltd.: *See*—
Yonezawa, Toshio; and Muraoka, Hisashi, 4,587,928, Cl. 118-500.000.

Tokyo Tatsuno Co., Ltd.: *See*—
Endo, Keizo; Matsumura, Hiroshi; Shimamura, Norio; and Kawabe, Masaru, 4,589,069, Cl. 364-405.000.

Toll, Douglas E. Orthodontic appliance. 4,588,380, Cl. 433-5.000.

Tomason, Garry. Anchoring means for a prefabricated roof or siding panel. 4,587,789, Cl. 52-713.000.

Tomihashi, Nobuyuki: *See*—
Ohmori, Akira; Tomihashi, Nobuyuki; and Shimizu, Yoshiki, 4,588,781, Cl. 525-200.000.

Tomita, Rioe. Compact portable grill apparatus. 4,587,947, Cl. 126-25.00R.

Tomoskozi, Istvan: *See*—
Gyory, Peter; Galambos, Geza; Kanay, Karoly; Ivanics, Jozsef; Dorman, Gyorgy; Kovacs, Gabor; Stadler, Istvan; Virag, Sandor; Tomoskozi, Istvan; Kormoczky, Peter; and Kovacs, Marianna, 4,588,713, Cl. 514-63.000.

Tomsen, Harald: *See*—
Fernandez-Acebal, Jose ; Herm, Jurgen; Tomsen, Harald; and Wilms, Walter, 4,588,119, Cl. 225-2.000.

Tonon, Thomas; Bruno, Claudio; and Leshner, Michael D., to Landau, David. Catalytic camping stove. 4,588,373, Cl. 431-328.000.

Tools & Machinery Builders, Inc.: *See*—
Cook, Ronald, 4,587,925, Cl. 118-211.000.

Topper, Robert J.: *See*—
Dischert, Robert A.; and Topper, Robert J., 4,589,019, Cl. 358-160.000.

Toray Industries, Inc.: *See*—
Oka, Koichiro, 4,588,617, Cl. 427-443.100.

Torborg, Ralph H., to Honeywell Inc. Flame ionization control of a partially premixed gas burner with regulated secondary air. 4,588,372, Cl. 431-78.000.

Torii, Sigeru; Tanaka, Hideo; and Akada, Mitsuo, to Otsuka Kagaku Yakuhin Kabushiki Kaisha. Process for preparing alkoxyphenols. 4,588,835, Cl. 560-254.000.

Torimaru, Yasuo; and Yoshimura, Masahiro, to Sharp Kabushiki Kaisha. Electronic viewfinder. 4,589,029, Cl. 358-224.000.

Toriumi, Mototada: *See*—
Ogawa, Hiroshi; Toriumi, Mototada; and Onoda, Shigeyoshi, 4,588,280, Cl. 355-3.00R.

Toriyama, Kazuhisa: *See*—
Nakagomi, Tamihito; Toriyama, Kazuhisa; and Ito, Masatoshi, 4,588,518, Cl. 252-299.610.

Torizuka, Hideki: *See*—
Hirai, Kenji; and Torizuka, Hideki, 4,588,964, Cl. 331-67.000.

Torre, Francesco: *See*—
Leone, Massimo; and Torre, Francesco, 4,587,764, Cl. 51-33.00W.

Torremans, Joseph L. G.: *See*—
Janssens, Frans E.; Torremans, Joseph L. G.; Hens, Jozef F.; and Van Offenwert, Theophilus T. J. M., 4,588,722, Cl. 514-228.000.

Toscano, Luciano, to Pierrel S.p.A. (8S)-8-fluoroerythromycin derivatives, the process for the preparation thereof and the pharmaceutical compositions containing them. 4,588,712, Cl. 514-29.000.

Totten, Patty L.: *See*—
Weigand, Willis A.; and Totten, Patty L., 4,588,032, Cl. 166-291.000.

Towns, Jeffrey A., to Insul Company, Inc. Side mounted lance for ladles. 4,588,170, Cl. 266-225.000.

Townsend, Donald W.; and Routery, Edward E., to Stellar Energy Systems, Inc. Circular arc solar concentrator. 4,587,951, Cl. 126-438.000.

Townsend, James H., Jr.: *See*—
Blackmer, David E.; and Townsend, James H., Jr., 4,589,129, Cl. 381-21.000.

Toyo Jozo Kabushiki Kaisha: *See*—
Matsumoto, Kunio; Kagimoto, Yoshitaka; Hirata, Tsutomu; Watanabe, Susumu; Ohtsuka, Akira; and Takahashi, Kiyoharu, 4,588,836, Cl. 562-448.000.

Toyoda Gosei Co., Ltd.: *See*—
Kasugai, Joji, 4,588,102, Cl. 220-203.000.

Toyohara, Makoto: *See*—
Suzuki, Tomonori; and Toyohara, Makoto, 4,588,385, Cl. 440-88.000.

Toyota Jidosha Kabushiki Kaisha: *See*—
Kobayashi, Nobuyuki; Yagi, Katsunori; and Ito, Toshimitsu, 4,587,938, Cl. 123-416.000.
Yoshitsugu, Noritada, 4,588,208, Cl. 280-805.000.

Toyotomi Kogyo Co., Ltd.: *See*—
Nakamura, Kazuharu; Matsumoto, Motoki; Yoshino, Tooru; and Niha, Osamu, 4,588,371, Cl. 431-14.000.

Tracy, Gene A.: *See*—
Miller, Cardell E.; Tracy, Gene A.; Engstrom, George L.; and Thorson, John, 4,588,221, Cl. 292-348.000.

Tramco S.A.: *See*—
Loire, Rene M. A.; and Pagezy, Michel J. E., 4,587,919, Cl. 114-230.000.

Transensory Devices, Inc.: *See*—
Allen, Henry V., 4,588,978, Cl. 340-58.000.

Tregilgas, John H., to Texas Instruments Incorporated. Method for producing graded band gap mercury cadmium telluride. 4,588,446, Cl. 148-1.500.

Trego, Jeannie L. Pet feeding dish having disposable liner and stationary mounting means. 4,587,930, Cl. 119-61.000.

Trenary, John M.; and Mammoser, Joseph G., to Teledyne Industries, Inc. Showerhead. 4,588,130, Cl. 239-381.000.

Triebel, Carol A.; Darden, Jerome W.; and Peterson, Edward S., to Texaco, Inc. Non-borate, non-phosphate antifreeze formulations containing dibasic acid salts as corrosion inhibitors. 4,588,513, Cl. 252-75.000.

Triman Limited: *See*—
Collins, Roy S., 4,587,748, Cl. 36-127.000.

Trimm, Inc.: *See*—
Newton, George W., 4,588,251, Cl. 339-182.00R.

Trinh, Vuong D.: *See*—
Magee, Robert D.; Asztalos, Michael J.; and Trinh, Vuong D., 4,588,548, Cl. 376-307.000.

Trumpf GmbH & Co.: *See*—
Bytow, Peter, 4,587,716, Cl. 29-568.000.

Trutzschler GmbH & Co. KG: *See*—
Hosel, Fritz, 4,587,691, Cl. 19-80.00R.

TRW Cam Gears Limited: *See*—
Adams, Frederick J., 4,588,161, Cl. 251-31.000.

TRW, Inc.: *See*—
Danico, Henry F., 4,588,104, Cl. 220-326.000.

TRW United-Carr GmbH: *See*—
Schmitz, Gunther; Greulich, Bodo; and Kettenring, Gerhard, 4,588,105, Cl. 220-359.000.

Tsao, Kuey-Yeou, to Gould Inc. Method of fabricating a Schottky barrier field effect transistor. 4,587,710, Cl. 29-571.000.

Tseng, Kuo-Shu: *See*—
Liau, Shung-Chung; Tseng, Kuo-Shu; and Huang, Yen H., 4,588,613, Cl. 427-230.000.

Tsernes, Vladimir Y.: *See*—
Alexandrov, Adolf M.; Volyansky, Igor I.; Yashin, Jury A.; and Tsernes, Vladimir Y., 4,588,330, Cl. 406-83.000.

Tsubota, Yasumasa: *See*—
Uno, Takaaki; Shibahata, Yasuji; and Tsubota, Yasumasa, 4,588,039, Cl. 180-140.000.

Tsubouchi, Kaoru, to Aisin Seiki Kabushiki Kaisha. Tandem brake booster for automotive vehicle. 4,587,884, Cl. 91-369.00A.

Tsuchida, Takayasu; Kurahashi, Osamu; Kawashima, Hiroki; Nakamori, Shigeru; and Enei, Hitoshi, to Ajinomoto Company Incorporated. Method for producing L-tryptophan by fermentation. 4,588,687, Cl. 435-108.000.

Tsuchihashi, Toshio, to Tokyo Shibaura Denki Kabushiki Kaisha. Vehicle for driving along a lead line. 4,588,041, Cl. 180-168.000.

Tsuji, Sadahiko, to Canon Kabushiki Kaisha. Video camera. 4,589,031, Cl. 358-227.000.

Tsukishima Kikai Co., Ltd.: *See*—
Takegami, Keizo; Morita, Minoru; Nakamaru, Kazuto; and Miwa, Koji, 4,588,414, Cl. 23-295.00R.

Tsukui, Tsutomu: *See*—
Shimizu, Toshio; Satoo, Takanori; Doi, Ryota; Yamaguchi, Motoo; Tsukui, Tsutomu; and Yoshioka, Yoshio, 4,588,660, Cl. 429-35.000.

Tsutsumi, Fumio: *See*—
Ono, Hisao; Tsutsumi, Fumio; Sakakibara, Mitsuhiko; and Okuya, Eitaro, 4,588,782, Cl. 525-245.000.

Tuan, Hsing C.; and Thompson, Malcolm J., to Xerox Corporation. Electrographic writing head. 4,588,997, Cl. 346-76.0PH.
Tucker, Robert C., Jr.: *See*—
Jackson, John E.; Adler, Thomas A.; Quets, Jean M.; and Tucker, Robert C., Jr., 4,588,608, Cl. 427-34.000.
Tuckey, Charles H., to Walbro Corporation. Rotary fuel pump with pulse modulation. 4,588,360, Cl. 417-366.000.
Tulcea, S.A.: *See*—
Staempfli, Jackie, 4,587,733, Cl. 30-278.000.
Tully, Wilfred R., to Roussel Uclaf. Imidazo[1,2-a]pyrimidines. 4,588,720, Cl. 514-217.000.
Tungstone Batteries Limited: *See*—
Mason, Anthony J.; May, Geoffrey J.; and Turner, Michael, 4,588,663, Cl. 429-54.000.
Tur, Moshe; Goodman, Joseph W.; Shaw, Herbert J.; Moslehi, Behzad; and Bowers, John E., to Leland Stanford Junior University, The Board of Trustees of the. Optical guided wave signal processor for matrix-vector multiplication and filtering. 4,588,255, Cl. 350-96.160.
Turner, Donald R., to Williams Industries, Inc. Thermostat cover. 4,588,851, Cl. 174-5.00R.
Turner, Michael: *See*—
Mason, Anthony J.; May, Geoffrey J.; and Turner, Michael, 4,588,663, Cl. 429-54.000.
Tuson, Samuel: *See*—
Ghilardi, Jean-Pierre R. F.; Forget, Rene F.; and Tuson, Samuel, 4,588,328, Cl. 405-202.000.
Tyrrell, F. Peter: *See*—
Burton, Jack D.; and Tyrrell, F. Peter, 4,589,033, Cl. 358-257.000.
Tyson, Joseph H.; Kennett, Leslie P.; and Davidson, Iain S., to British Nuclear Fuels plc. Electric signal transfer systems. 4,588,376, Cl. 432-36.000.
Uchino, Fumio: *See*—
Nakamura, Yuzo; Uchino, Fumio; Tateoka, Hitoshi; and Ishibashi, Junichi, 4,587,848, Cl. 73-632.000.
Udd, Eric: *See*—
Cahill, Richard F.; and Udd, Eric, 4,588,296, Cl. 356-350.000.
Ueda, Takanobu: *See*—
Nakaya, Toshiharu; Uenaka, Akimitsu; and Ueda, Takanobu, 4,588,759, Cl. 523-414.000.
Ueda, Takeo; and Morinaga, Masaru, to NSK Warner K. K. Buckle for seat belt. 4,587,696, Cl. 24-637.000.
Ueda, Yuichi: *See*—
Yasuda, Shinichiro; Morimoto, Eiji; and Ueda, Yuichi, 4,588,668, Cl. 430-109.000.
Uenaka, Akimitsu: *See*—
Nakaya, Toshiharu; Uenaka, Akimitsu; and Ueda, Takanobu, 4,588,759, Cl. 523-414.000.
Ueno, Hiroshi: *See*—
Imai, Masafumi; Yamamoto, Tadashi; Furuhashi, Hiroyuki; Ueno, Hiroshi; and Inaba, Naomi, 4,588,793, Cl. 526-124.000.
Uetsuki, Haruo; and Yorikane, Toshiaki, to Ryobi Ltd. Handle for a fishing spinning reel. 4,588,141, Cl. 242-84.10J.
Uhl, Robert F.: *See*—
Burger, Laurie J.; Protzmann, Donald E.; and Uhl, Robert F., 4,588,306, Cl. 374-158.000.
Ujiie, Seiichi: *See*—
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Savioli, Giulio V., 4,587,879, Cl. 89-33.250.
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Mahan, Donald R., 4,588,721, Cl. 514-220.000.

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Usry, Joe; Atkins, Roger; and Faddis, Chris, to Bunnell Life Systems, Inc. Humidifier. 4,588,425, Cl. 55-227.000.

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Huang, Fu-chih, 4,588,737, Cl. 514-392.000.
Suh, John T.; Skiles, Jerry W.; Williams, Bruce E.; and Schwab, Alfred, 4,588,734, Cl. 514-311.000.

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van der Meer, Jan, to Polaroid Corporation. Photographic apparatus. 4,588,275, Cl. 354-150.000.

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Van Erden, Donald L.; and Ausnit, Steven, to Signode Corporation. Packaging material and package. 4,589,145, Cl. 383-5.000.

Van Gils, Adrianus W.; and Boogaart, Abraham V. D., to I I. E. Innovation Enterprise Ltd. Down hole blow out preventer and method of use. 4,588,035, Cl. 175-48.000.

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Jayadev, Tumkur S.; Van Nguyen, On; Reyes, Jaime M.; Davis, Helen; and Putty, Michael W., 4,588,520, Cl. 252-512.000.

Van Offenwert, Theophilus T. J. M.: *See*—
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Varian Associates, Inc.: *See*—
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Vasvari nee Debreczy, Lelle: *See*—
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Vehmas, Olavi E.; Kotyuk, Bernard L.; and Pallo, John M., to Manville Sales Corporation. Multipurpose fire resistant sealing and caulking compound. 4,588,769, Cl. 524-448.000.

Vektronics Manufacturing, Inc.: *See*—
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Venaas, Norman B.: *See*—
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Venaleck, John T., to 4C Electronics, Inc. Programmed socket. 4,588,239, Cl. 339-17.0CF.

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Ventura, Angelo; and Ventura, Luciano, 4,587,961, Cl. 128-25.00R.

VEPA Zellstoff - und Papierholding AG: *See*—
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Vernon, Stanley M., to Advanced Energy Fund Limited Partnership. Metal organic chemical vapor deposition of 111-v compounds on silicon. 4,588,451, Cl. 148-175.000.

Verton, Jose; and Guerard, Norbert, to Champion Spark Plug Europe S.A. Wiper assembly for motor vehicles. 4,587,685, Cl. 15-250.420.

Victor Company of Japan, Limited: *See*—
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Vidrine, D. Warren; and Allhands, Daniel R., to Nicolet Instrument Corporation. Light-pipe flow cell for supercritical fluid chromatography. 4,588,893, Cl. 250-428.000.

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Villa, James G.: *See*—
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Villaveces, James. Cart for transporting computer components. 4,588,202, Cl. 280-655.000.

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Vincler, Michael P.; and Meigs, Thomas E., to Mooney Chemicals, Inc. Process for preparing aqueous cobalt (II) carbonate slurries, and slurries so produced. 4,588,572, Cl. 423-419.00R.

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Hermecz, Istvan; Vasvari nee Debreczy, Lelle; Horvath, Agnes; Kokosi, Jozsef; Virag, Sandor; and Breining, Tibor, 4,588,526, Cl. 260-243.300.

Virgille, Jacques; Jodry, Francois; and Juglair, Antoine, to Aciers et Outillage Peugeot. Air filter for internal combustion engine. 4,588,426, Cl. 55-337.000.

Vlahos, Paul E.; Vlahos, Petro; and Fellinger, David F., to 501 Ultimatte Corporation. Automated encoded signal color image compositing. 4,589,013, Cl. 358-22.000.

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Vodavi Technology Corporation: *See*—
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Voest-Alpine International Corporation: *See*—
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Volker, Herbert: *See*—
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Volleau, Patrick; Bricot, Claude; Audouin, Michel; Leterme, Dominique; and Le Merer, Jean P., to Thomson-CSF. Device for compensating the lack of balance of a deviating mirror belonging to an optical system for illuminating a data medium. 4,589,102, Cl. 369-46.000.
Vollmer, Jurgen; and Herchenbach, Paul, to Jean Walterscheid GmbH. Coupling device. 4,588,323, Cl. 403-12.000.
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Wadensten, Theodore S. Vibration dampening apparatus for motor actuated eccentric forces. 4,587,863, Cl. 74-87.000.
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Waldron, Michael J. Personal sound system. 4,589,134, Cl. 381-90.000.
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Walker, Roy D., Sr. Descent control device. 4,588,045, Cl. 182-5.000.
Walley, David H.; and Fitch, James C., to Frontier Technology, Inc. Water scavenger pouch. 4,588,505, Cl. 210-502.100.
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Warner-Lambert Company: *See—*
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Watthey, Jeffrey W. H., to Ciba-Geigy Corporation. Propylamine derivatives. 4,588,746, Cl. 514-554.000.
Watts, Kevin P.; and Robinson, Jeffrey I., to Texas Instruments Incorporated. Differential amplifiers and method of differentially driving a two-wire line circuit. 4,588,858, Cl. 179-16.0AA.
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Webb, Franklyn L.: *See—*
Uttley, Larry G.; and Webb, Franklyn L., 4,587,781, Cl. 52-242.000.
Weber, Heinrich; Lorenz, Kurt; and Dungs, Horst, to Carl Still GmbH & Co. K.G., Firma. Device for cooling incandescent coke. 4,588,479, Cl. 202-228.000.
Wedam, Werner F.; Babcock, William E.; and Schmoke, Julian M., Jr., to RCA Corporation. Power supply and deflection circuit providing multiple scan rates. 4,588,929, Cl. 315-395.000.
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Wegman, Mark N.: *See—*
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Wegmann & Co. GmbH: *See—*
Sprafke, Uwe, 4,587,880, Cl. 89-36.140.
Weich, Debra L.; and Pratt, William J., to Kobe Steel Ltd. Loaded hydraulically actuatable piston and controls system therefor. 4,588,057, Cl. 192-3.00R.
Weigand, Willis A.; and Totten, Patty L., to Halliburton Company. Fluid spacer composition for use in well cementing. 4,588,032, Cl. 166-291.000.
Weinstein, Jack, to Bristol-Myers Company. Closure for roll-on applicator. 4,588,320, Cl. 401-213.000.
Weiss, Merkel F.; Parrott, Joel C.; and Martel, Lisa, to American Hospital Supply Corporation. Vented syringe adapter assembly. 4,588,403, Cl. 604-411.000.
Weiss, Steven J.: *See—*
Fountain, Michael W.; Weiss, Steven J.; and Popescu, Mircea C., 4,588,578, Cl. 424-1.100.
Weisser, Erich: *See—*
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Weisskopf, Ernst: *See—*
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Weitzel, Rose M.: *See—*
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Wella Aktiengesellschaft: *See—*
Konrad, Eugen; Braun, Hans-Jurgen; and Mager, Herbert, 4,588,410, Cl. 8-421.000.
Weller, Sybille: *See—*
Hemminger, Herman; Jundt, Werner; Weller, Sybille; and Werner, Peter, 4,587,939, Cl. 123-479.000.
Welschlau, Udo, to VEPA Zellstoff - und Papierholding AG. Corrugated paper installation for manufacturing of printed corrugating paper cuts with a corrugated paper machine and a rotary printing machine integrated therein. 4,587,898, Cl. 101-224.000.
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Wentzell, Joseph M. Methods of controlling solidification of metal baths. 4,588,019, Cl. 164-470.000.
Wenz, Herbert; and Schneider, Franz, to Pfaff Industriemaschinen GmbH. Method and sewing machine for approaching a predetermined end point of a seam. 4,587,915, Cl. 112-275.000.
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Werth, John: *See—*
Kaufman, Arthur; and Werth, John, 4,588,661, Cl. 429-36.000.
Wessels, Ewald J. H. Method of sheet metal processing. 4,587,827, Cl. 72-349.000.
West, David G., to Cooper Industries, Inc. Shear pin relief valve. 4,587,987, Cl. 137-70.000.
West, Neil L.: *See—*
Thomas, Kenneth R.; and West, Neil L., 4,587,799, Cl. 56-14.600.

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Schaeffel, John A., Jr.; Madderra, Jimmy M.; and West, Ronald L., 4,588,146, Cl. 244-3.270.

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Western Company of North America, The: *See—*
Hyde, Patrick C.; and Burroughs, Van C., 4,588,509, Cl. 210-788.000.

Western Geophysical Company of America: *See—*
Bush, Darrell C., 4,587,857, Cl. 73-863.000.
Savit, Carl H., 4,589,100, Cl. 367-77.000.

Westinghouse Electric Corp.: *See—*
Heyne, Carl J., 4,588,914, Cl. 310-156.000.
Impink, Albert J., Jr.; and Langford, Francis L., Jr., 4,588,547, Cl. 376-254.000.
Magee, Robert D.; Asztalos, Michael J.; and Trinh, Vuong D., 4,588,548, Cl. 376-307.000.
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Whaley, Howard A.: *See—*
Magerlein, Barney J.; and Whaley, Howard A., 4,588,817, Cl. 548-125.000.

Wheland, Robert C., to Du Pont de Nemours, E. I., and Company. Fluoroolefin polymerization process using fluoroxy compound solution as initiator. 4,588,796, Cl. 526-214.000.

Whelen Engineering Co., Inc.: *See—*
Ferenc, Robert A.; and Lyons, Harold W., 4,588,118, Cl. 224-331.000.

White Castle System, Inc.: *See—*
Brabb, James D.; and Simpson, Dennis L., 4,588,133, Cl. 239-681.000.

White, Paul K., to Burroughs Corporation. Fastener for holding SIPs on PC boards during soldering. 4,588,177, Cl. 269-41.000.

Wico Corporation: *See—*
Dell, George H., 4,588,187, Cl. 273-1.00E.

Widder, Rudi: *See—*
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Wiersema, Dale T.; and Kirschensteiner, Fred, to Westinghouse Electric Corp. Conductor bundle edge-bending tool for a dynamoelectric generator. 4,587,824, Cl. 72-217.000.

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Wilczewski, Robert H.: *See—*
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Wile, Donald T., to National Semiconductor Corporation. Low noise constant amplitude oscillator circuit. 4,588,968, Cl. 331-109.000.

Willi Studer AG, Fabrik fur elektronische Apparate: *See—*
Schmid, Johann J.; and Thie, Werner, 4,587,976, Cl. 128-699.000.

William H. Rorer, Inc.: *See—*
Studt, William L.; Kuhls, Donald E.; and Campbell, Henry F., 4,588,719, Cl. 514-212.000.

Williams, Alvin. Sole and heel shoe tap. 4,587,746, Cl. 36-73.000.

Williams, Bruce E.: *See—*
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Williams, David L.: *See—*
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Williams Industries, Inc.: *See—*
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Williams, John E., Jr., to AAKAC Industries Inc. Torsion suspension system for motorcycles having improved center of gravity. 4,588,196, Cl. 280-5.00A.

Williams, Robert E., Jr., to General Electric Company. Sulfonate-terminated polyimides and polyamic acids and method for their preparation. 4,588,805, Cl. 528-172.000.

Willman, Carol J.: *See—*
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Wilms, Walter: *See—*
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Wilson, Dennis W., to Designs Unlimited, Inc. Mechanical security device. 4,587,814, Cl. 70-232.000.

Wilson, James M. Hand punch. 4,587,737, Cl. 30-358.000.

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Winner, Ralph. Gas feed safety device for amputees. 4,587,865, Cl. 74-562.500.

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Winston, Walter F.: *See—*
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Wirtschafter, Jonathan D.; and Walton, Richard S., to Mediminder Development Limited Partnership. Medical timer apparatus. 4,588,303, Cl. 368-10.000.

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DeLuca, Hector F.; Ikekawa, Nobuo; and Tanaka, Yoko, 4,588,528, Cl. 260-397.200.
DeLuca, Hector F.; and Schnoes, Heinrich K., 4,588,716, Cl. 514-168.000.

Wissman, Lance R.; Bouwer, Sandra D.; and Jeluso, Cheryl L. Method of installing an artificial toe or finger nail at the site of the surgical removal of the natural nail. 4,587,983, Cl. 132-73.000.

Witten, Alvin E.; and Witten, Erik H., to Witten Automatic Vent Company, Inc. Foundation ventilator. 4,587,892, Cl. 98-29.000.

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Witten, Erik H.: *See—*
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Wofford, Miles D. Method for preparing a gelatinous food product stabilizer. 4,588,603, Cl. 426-576.000.

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Wolfe, Henry S., to Gulf Coast Aqua Leisure, Inc. Ornamental floating apparatus. 4,588,618, Cl. 428-7.000.

Wolff, James W.; and Liakus, Sandra J., to Union Special Corporation. Sewing machine lubrication system. 4,587,912, Cl. 112-256.000.

Wolff Walsrode AG: *See—*
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Wolfram, Leszek J.: *See—*
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Wolloff, Frank H.: *See—*
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Woodard, Kenneth E., Jr.; Justice, David D.; and Hilliard, Garland E., to Olin Corporation. High current density cell. 4,588,483, Cl. 204-59.00R.

Woods, Neil W., to Anthes Equipment Limited. Scaffolding and locking discs therefor. 4,587,786, Cl. 52-638.000.

Woolslayer, Homer J.; and Jenkins, Cecil, to Lee C. Moore Corporation. Method and apparatus for erecting a drilling rig mast. 4,587,778, Cl. 52-116.000.

Worldsbest Industries, Inc.: *See—*
Basore, Wayne, 4,588,154, Cl. 248-99.000.

Worthington, Ralph E.; Magdics, Alex; and Stain, Donald B., to Prodeco, Inc. Method for the production of potassium sulfate using sulfuric acid and potassium chloride. 4,588,573, Cl. 423-552.000.

Wray, Daniel X., to Dynamic Disk, Inc. Magnetic memory disk. 4,588,653, Cl. 428-600.000.

Wu, Yung-Shain: *See—*
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Wurminghausen, Thomas; Saykowski, Franz; and Sattlegger, Hans, to Bayer Aktiengesellschaft. Polyorganosiloxane compositions which harden into elastomers at room temperature. 4,588,770, Cl. 524-731.000.

Wydro, Robert: *See—*
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Xerox Corporation: *See—*
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Elter, Michael R., 4,588,281, Cl. 355-3.0FU.
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Yabuta, Mitsuo: *See*—
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Yamada, Hidetoshi; Yusa, Atsushi; Mizusaki, Takashi; and Nishizawa, Jun-ichi, to Olympus Optical Co., Ltd. Solid state image sensor comprising photoelectric converting film and reading-out transistor. 4,589,003, Cl. 357-22.000.
Yamada, Shiro. Treated hair for implantation. 4,588,408, Cl. 623-15.000.
Yamada, Takeshi: *See*—
Imai, Takaichi; Yamada, Takeshi; Sakaue, Kunio; Isoyama, Eizo; Mizoguchi, Masaaki; and Tanaka, Katsumi, 4,588,025, Cl. 165-133.000.
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Yamada, Yoji; Matsuura, Michinori; and Kakeshita, Yoshiaki, to Shimpo Kogyo Kabushiki Kaisha. Tensionmeter. 4,587,855, Cl. 73-862.480.
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Yamamoto, Itsuo: *See*—
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Yamamoto, Kenzo; and Bessho, Kenji, to Yamaho Kogyo Co., Ltd. Nozzle for spraying agricultural chemicals. 4,588,131, Cl. 239-428.500.
Yamamoto, Tadashi; Nagata, Masato; and Oba, Tomoyuki, to Chugai Ro Co., Ltd. Continuous heat treating furnace for metallic strip. 4,588,378, Cl. 432-59.000.
Yamamoto, Tadashi: *See*—
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Yamamoto, Takashi; Takahashi, Hiroyuki; and Awata, Satoshi, to Murato Mfg. Co., Ltd. Housing and mount for chip type piezoelectric resonator. 4,588,918, Cl. 310-348.000.
Yamamura, Hiroshi: *See*—
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Yamamuro, Sigeaki; Abo, Keiju; Tanaka, Yoshikazu; Kumura, Haruyoshi; Hirano, Hiroyuki; and Morimoto, Yoshiro, to Nissan Motor Co., Ltd. Method and apparatus for controlling reduction ratio of continuously variable transmission with acceleration compensation. 4,589,071, Cl. 364-424.100.
Yamamuro, Tetsu; and Iwasaki, Kyuhachiro, to Ricoh Company, Ltd. Ink jet head having curved ink. 4,588,998, Cl. 346-140.00R.
Yamanishi, Eiichi; Oono, Kenichi; Gokita, Masami; Futaki, Kenji; and Watanabe, Junji, to Kabushiki Kaisha Toshiba. Multiple copy image forming apparatus and method. 4,589,035, Cl. 358-296.000.
Yamashita, Kiyoshi, to Tokyo Automatic Machinery Works, Ltd. Discharge device for bag-making, filling and packing apparatus. 4,587,795, Cl. 53-551.000.
Yamazaki, Shunpei, to Semiconductor Energy Laboratory Co., Ltd. Photo-chemical vapor deposition of silicon nitride film. 4,588,610, Cl. 427-54.100.
Yamazaki, Toshiyuki, to Sanshin Kogyo Kabushiki Kaisha. Outboard motor with engine tachometer. 4,587,935, Cl. 123-198.00R.
Yanai, Akio: *See*—
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Yanz, Rudolph A., Jr.; and Spector, George. Disposable tooth brush. 4,588,089, Cl. 206-581.000.
Yao, Jame; Chen, Jong J.; and Elliot, Douglas G., to DM International Inc. Method and apparatus for purification of high N_2 content gas. 4,588,427, Cl. 62-17.000.
Yardley, Robert: *See*—
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Yardy, Raymond: *See*—
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Yasuda, Mamoru; and Nishimura, Takeshi, to Mitutoyo Mfg. Co., Ltd. Supervisory device for wrong operation of varying quantity measuring apparatus. 4,588,989, Cl. 340-663.000.
Yasuda, Seiji; Yonezawa, Toshio; Hiraki, Shunichi; and Miyagawa, Masafumi, to Tokyo Shibaura Denki Kabushiki Kaisha. Semiconductor device monolithically comprising a V-MOSFET and bipolar transistor isolated from each other. 4,589,004, Cl. 357-23.400.
Yasuda, Shinichiro; Morimoto, Eiji; and Ueda, Yuichi, to Kao Corporation. Polyester resin, electrophotographic developer composition. 4,588,668, Cl. 430-109.000.
Yasuzuka, Takezou, to Kabushiki Kaisha Toshiba. Vacuum tube and a method for manufacturing the same. 4,588,894, Cl. 250-483.100.
Yazaki, Takashi: *See*—
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Yazawa, Nobuharu, to Mitsubishi Denki Kabushiki Kaisha. Analog switching circuit with Zener diode input clamp. 4,588,902, Cl. 307-200.00A.
Yen, Wen-Hsiung. Press machine. 4,587,831, Cl. 72-453.030.
Yin, Chieh-Kung; and Adamski, Maximilian, to Union Special Corporation. Automatic sewing apparatus. 4,587,913, Cl. 112-262.300.
Yokoi, Kouichi: *See*—
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Yoshida, Kazuo; and Umemoto, Tadahiro, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Method for relieving residual stresses by controlling weld heat input. 4,588,869, Cl. 219-76.140.
Yoshida Kogyo K.K.: *See*—
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Yoshimura, Masahiro: *See*—
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Yoshino Kogyosho Co., Ltd.: *See*—
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Yoshino, Tooru: *See*—
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Yoshinori, Mizuki. Throwaway-type ball end mill and throwaway tip used in same. 4,588,331, Cl. 407-36.000.
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Yoshitsugu, Noritada, to Toyota Jidosha Kabushiki Kaisha. Safety belt. 4,588,208, Cl. 280-805.000.
Yoshiyuki, Iwaki; Akio, Matsumoto; and Mitsuyoshi, Yokota, to Mitsubishi Denki Kabushiki Kaisha. Charging system for a car. 4,588,939, Cl. 322-88.000.
Young, Ronald L.; Rock, Eugene F.; and Brandt, David E., to ERDA, Inc. Adjustable chair for aircraft and the like. 4,588,226, Cl. 297-349.000.
Younger, Gilbert M.: *See*—
Shoemaker, James E.; and Younger, Gilbert M., 4,588,322, Cl. 403-1.000.

Yu Lu, Shi-Da: *See*—
Mark, David F.; Lin, Leo S.; and Yu Lu, Shi-Da, 4,588,585, Cl. 424-85.000.

Yuguchi, Hiroya: *See*—
Okonogi, Shigeo; Kawashima, Takuji; Kudo, Tsutomu; Yuguchi, Hiroya; Hiramatsu, Akinori; Teraguchi, Susumu; and Yaeshima, Tomoko, 4,588,595, Cl. 426-43.000.

Yum, Su I.: *See*—
Gale, Robert M.; Goetz, Victor; Lee, Eun S.; Taskovich, Lina T.; and Yum, Su I., 4,588,580, Cl. 424-21.000.

Yusa, Atsushi: *See*—
Yamada, Hidetoshi; Yusa, Atsushi; Mizusaki, Takashi; and Nishizawa, Jun-ichi, 4,589,003, Cl. 357-22.000.

Zacharias, Ernst, to Matth Hohner AG. Key board system for an electronic musical instrument. 4,587,877, Cl. 84-1.100.

Zaweski, Edward F.; and Niebylski, Leonard M., to Ethyl Corporation. Fuel compositions. 4,588,415, Cl. 44-57.000.

Zaweski, Edward F.; and Niebylski, Leonard M., to Ethyl Corporation. Fuel compositions. 4,588,416, Cl. 44-57.000.

Zaweski, Edward F.; and Miebylski, Leonard M., to Ethyl Corporation. Fuel compositions. 4,588,417, Cl. 44-57.000.

Zebrowski, Greg; and Popat, Ghanshyam H., to Avery International Corporation. Powerful magnetic folio. 4,588,209, Cl. 281-45.000.

Zeifang, Gunter: *See*—
Menke, Josef F.; and Zeifang, Gunter, 4,588,254, Cl. 350-6.700.

Zeigler, John M.: *See*—
Harrah, Larry A.; and Zeigler, John M., 4,588,801, Cl. 528-33.000.

Zeiler, Hans-Joachim: *See*—
Petersen, Uwe; Grohe, Klaus; Zeiler, Hans-Joachim; and Metzger, Karl G., 4,588,726, Cl. 514-254.000.

Zibell, Bodo; Patrovsky, Hubert; and Gneuss, Detlef, to Detlef Gneuss. Sieve device for cleaning molten plastics. 4,588,502, Cl. 210-171.000.

Ziehm, Richard T.: *See*—
Downing, Curtis B.; Wilczek, Stephen P.; Ziehm, Richard T.; Federico, Anthony M.; Husted, Raymond R.; and Edmunds, Michael E., 4,589,090, Cl. 364-900.000.

Zik, John J.: *See*—
Bollinger, John G.; Zik, John J.; and Duffie, Neil A., 4,588,872, Cl. 219-124.340.

Zimmer, Inc.: *See*—
Walker, Charles B.; Hori, Roy Y.; and Butler, Michael B., 4,587,964, Cl. 128-92.00E.

Zingales, Maria, deceased: *See*—
Felder, Ernst; and Zingales, Maria, deceased, 4,588,574, Cl. 423-554.000.

Zinsmeyer, Thomas M., to Carrier Corporation. Microcomputer system for controlling the capacity of a refrigeration system. 4,589,060, Cl. 364-148.000.

Zwilling, Hermann, to Rehau Plastiks AG & Co. Method of making a pipe cluster unit. 4,588,459, Cl. 156-85.000.

2500 Corporation, The: *See*—
Roth, David W., 4,588,628, Cl. 428-85.000.

4C Electronics, Inc.: *See*—
Venaleck, John T., 4,588,239, Cl. 339-17.0CF.

501 Ultimatte Corporation: *See*—
Vlahos, Paul E.; Vlahos, Petro; and Fellinger, David F., 4,589,013, Cl. 358-22.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 13TH DAY OF MAY, 1986

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Avins, Jack; and Kirkwood, Loren R., to RCA Corporation. Control apparatus for a color television receiver. Re. 32,148, Cl. 358-27.000.

Bianchi, Nereo: *See—*
Carbonato, Gianfranco; and Bianchi, Nereo, Re. 32,143, Cl. 112-454.000.

Carbonato, Gianfranco; and Bianchi, Nereo, to Necchi S.p.A. Household type sewing machine having microprocessor control. Re. 32,143, Cl. 112-454.000.

Cosner, Alice V. Sink scraper and garbage tamper for electric garbage disposal. Re. 32,141, Cl. 15-105.000.

Hercules Incorporated: *See—*
Shemano, Irving, Re. 32,145, Cl. 514-481.000.

Keefer, Bowie G. Reverse osmosis method and apparatus. Re. 32,144, Cl. 210-637.000.

Kirkwood, Loren R.: *See—*
Avins, Jack; and Kirkwood, Loren R., Re. 32,148, Cl. 358-27.000.

Meyers, Louis B. Method and apparatus for making carbonated beverages. Re. 32,142, Cl. 141-4.000.

Miller, Richard W.: *See—*
Schwarz, Meyer; Miller, Richard W.; and Wright, James E., Re. 32,146, Cl. 514-717.000.
Schwarz, Meyer; Miller, Richard W.; and Wright, James E., Re. 32,147, Cl. 514-717.000.

Necchi S.p.A.: *See—*
Carbonato, Gianfranco; and Bianchi, Nereo, Re. 32,143, Cl. 112-454.000.

RCA Corporation: *See—*
Avins, Jack; and Kirkwood, Loren R., Re. 32,148, Cl. 358-27.000.

Schwarz, Meyer; Miller, Richard W.; and Wright, James E., to United States of America, Agriculture. Insect maturation inhibitors. Re. 32,146, Cl. 514-717.000.

Schwarz, Meyer; Miller, Richard W.; and Wright, James E., to United States of America, Agriculture. Insect maturation inhibitors. Re. 32,147, Cl. 514-717.000.

Shemano, Irving, to Hercules Incorporated. Orally active tolciclate [(and tolnaftate)]. Re. 32,145, Cl. 514-481.000.

United States of America
Agriculture: *See—*
Schwarz, Meyer; Miller, Richard W.; and Wright, James E., Re. 32,146, Cl. 514-717.000.
Schwarz, Meyer; Miller, Richard W.; and Wright, James E., Re. 32,147, Cl. 514-717.000.

Wright, James E.: *See—*
Schwarz, Meyer; Miller, Richard W.; and Wright, James E., Re. 32,146, Cl. 514-717.000.
Schwarz, Meyer; Miller, Richard W.; and Wright, James E., Re. 32,147, Cl. 514-717.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Algarid Pty. Ltd.: *See—*
Rigby, Robert A., B1 4,065,386, Cl. 210-695.000.

Donaldson, Edward: *See—*
Van Ness, John F.; and Donaldson, Edward, B1 4,353,991, Cl. 501-20.000.

Falkow, Stanley; and Moseley, Stephen L., to University of Washington, Board of Regents of the. Specific DNA probes in diagnostic microbiology. B1 4,358,535, 5-13-86, Cl. 435-5.000.

Ferro Corporation: *See—*
Van Ness, John F.; and Donaldson, Edward, B1 4,353,991, Cl. 501-20.000.

Foster, Elton G.; and Lutz, Eugene F., to Shell Oil Company. Process for oxidation of isobutane. B1 4,408,081, 5-13-86, Cl. 568-571.000.

Lutz, Eugene F.: *See—*
Foster, Elton G.; and Lutz, Eugene F., B1 4,408,081, Cl. 568-571.000.

Molins Limited: *See—*
Williamson, David T. N., B1 4,369,563, Cl. 29-568.000.

Moseley, Stephen L.: *See—*
Falkow, Stanley; and Moseley, Stephen L., B1 4,358,535, Cl. 435-5.000.

Rigby, Robert A., to Algarid Pty. Ltd. Algae growth control. B1 4,065,386, 5-13-86, Cl. 210-695.000.

Shell Oil Company: *See—*
Foster, Elton G.; and Lutz, Eugene F., B1 4,408,081, Cl. 568-571.000.

Smith, John Conventry, Jr.: *See—*
Williamson, David T. N., B1 4,369,563, Cl. 29-568.000.

University of Washington, Board of Regents of the: *See—*
Falkow, Stanley; and Moseley, Stephen L., B1 4,358,535, Cl. 435-5.000.

Van Ness, John F.; and Donaldson, Edward, to Ferro Corporation. Glass composition and method of manufacture and article produced therefrom. B1 4,353,991, 5-13-86, Cl. 501-20.000.

Williamson, David T. N., to Molins Limited; and Smith, John Conventry, Jr. Automated machine tool installation with storage means. B1 4,369,563, 5-13-86, Cl. 29-568.000.

LIST OF DESIGN PATENTEES

A-Dec Diversified, Inc.: *See—*
Cowdery, Gary D.; and Owczarzak, Thomas J., 283,782, Cl. D8-74.000.

Aavid Engineering, Inc.: *See—*
McCarthy, Alfred F., 283,813, Cl. D13-23.000.

Agari, Atsunori: *See—*
Harashima, Tadashi; and Agari, Atsunori, 283,809, Cl. D12-145.000.

Albright, Henry J., to Fawn Engineering Corp. Vending cabinet. 283,827, 5-13-86, Cl. D20-4.000.

Allars, Brian: *See—*
Edwards, David O.; and Allars, Brian, 283,815, Cl. D14-60.000.

American Commercial, Incorporated: *See—*
Blake, Alfred; and Lax, Michael, 283,773, Cl. D7-13.000.
Laslo, Larry R., 283,780, Cl. D7-320.000.

AT&T Bell Laboratories: *See—*
Genaro, Donald M.; and McGarvey, John N., 283,814, Cl. D14-60.000.

Beeren, Aloysius J. M., to U.S. Philips Corporation. Coffee maker. 283,779, 5-13-86, Cl. D7-309.000.

Beerens, Cornelis J. Liquid dispensing spout. 283,800, 5-13-86, Cl. D9-447.000.

Belaiche, Serge, to Serdaneli. Door handle. 283,785, 5-13-86, Cl. D8-308.000.

Blake, Alfred; and Lax, Michael, to American Commercial, Incorporated. Champagne glass. 283,773, 5-13-86, Cl. D7-13.000.

Bound, Patrick S. Combined helmet and beverage container holders. 283,749, 5-13-86, Cl. D2-246.000.

Bratcher, Freda L. Tray attachment. 283,774, 5-13-86, Cl. D7-39.000.
British Telecommunications: *See*—
Edwards, David O.; and Allars, Brian, 283,815, Cl. D14-60.000.
Brown, Philip M.; and Podgorski, Richard S. Spray gun for aerosol can. 283,801, 5-13-86, Cl. D9-448.000.
Brown, William E. Clutch plate alignment hub. 283,819, 5-13-86, Cl. D15-148.000.
Camp, Douglas C. P. J.: *See*—
Macintyre, Hugh M. G., 283,833, Cl. D23-43.000.
Campbell, William P. Drinking vessel base. 283,775, 5-13-86, Cl. D7-39.000.
Campus Creations of Missouri, Inc.: *See*—
Duty, James A., 283,748, Cl. D1-106.000.
Caruso, Jerome. Chair for use primarily by a draftsman. 283,762, 5-13-86, Cl. D6-360.000.
Champion Spark Plug Company: *See*—
Weinstein, Richard; and Seitz, David M., 283,832, Cl. D23-18.000.
Chap, John P., to Selfix, Inc. Hook. 283,786, 5-13-86, Cl. D8-370.000.
Chap, John P., to Selfix, Inc. Utility hook. 283,787, 5-13-86, Cl. D8-370.000.
Chen, Ching-Chou. Combined toothbrush, flosser and toothpick. 283,761, 5-13-86, Cl. D4-108.000.
Chicago Booth Mfg. Co., Inc.: *See*—
Livieratos, Christos, 283,763, Cl. D6-364.000.
Livieratos, Cnristos, 283,764, Cl. D6-364.000.
Livieratos, Christos, 283,765, Cl. D6-364.000.
Livieratos, Christos, 283,766, Cl. D6-364.000.
Livieratos, Christos, 283,767, Cl. D6-364.000.
Livieratos, Christos, 283,768, Cl. D6-364.000.
Citizen Watch Co., Ltd.: *See*—
Mitsuhashi, Toshio, 283,823, Cl. D18-13.000.
Coca-Cola Company, The: *See*—
Richter, Simon J., 283,794, Cl. D9-396.000.
Cohn, Robert J., to InterMetro Industries Corp. Delivery/storage cabinet. 283,769, 5-13-86, Cl. D6-446.000.
Colquitt, Simone, to Syracuse China Corporation. Decal for use on china dinnerware or similar articles. 283,776, 5-13-86, Cl. D7-39.000.
Container Corporation of America: *See*—
Montealegre, James W., 283,797, Cl. D9-431.000.
Cosden Technology, Inc.: *See*—
Fortuna, Vincent E.; and MacLaughlin, Donald N., 283,792, Cl. D9-349.000.
Cowdery, Gary D.; and Owczarzak, Thomas J., to A-Dec Diversified, Inc. Clamp for jewelry finding. 283,782, 5-13-86, Cl. D8-74.000.
Cox, Terence A.; Johnson, Paul M.; and Horton, Philip C., to Swish Products Limited. Traverse curtain rod. 283,788, 5-13-86, Cl. D8-377.000.
Croydon, Frederic G., to Omark Industries, Inc. Circular saw blade. 283,784, 5-13-86, Cl. D8-70.000.
Cutler, Gordon L., to Quaker Oats Company, The. Monitor receiver. 283,816, 5-13-86, Cl. D14-68.000.
Demourgues, Alain, to Saint-Gobain-Desjonqueres. Bottle. 283,795, 5-13-86, Cl. D9-413.000.
Dobbins, John J. Pendant. 283,807, 5-13-86, Cl. D11-79.000.
Duty, James A., to Campus Creations of Missouri, Inc. Ice cream sandwich. 283,748, 5-13-86, Cl. D1-106.000.
Edwards, David O.; and Allars, Brian, to British Telecommunications. Cordless telephone base. 283,815, 5-13-86, Cl. D14-60.000.
Ehrlich, Earl A.: *See*—
Kutsch, Harold G.; and Ehrlich, Earl A., 283,839, Cl. D23-153.000.
Fawn Engineering Corp.: *See*—
Albright, Henry J., 283,827, Cl. D20-4.000.
Fortuna, Vincent E.; and MacLaughlin, Donald N., to Vercon, Inc. Packaging container. 283,791, 5-13-86, Cl. D9-349.000.
Fortuna, Vincent E.; and MacLaughlin, Donald N., to Cosden Technology, Inc. Packaging container. 283,792, 5-13-86, Cl. D9-349.000.
Fortuna, Vincent E.; and MacLaughlin, Donald N., to Vercon, Inc. Packaging container. 283,793, 5-13-86, Cl. D9-349.000.
Gamm, Robert J., to Kangaroos U.S.A., Inc. Casual shoe with pocket. 283,750, 5-13-86, Cl. D2-313.000.
Genaro, Donald M.; and McGarvey, John N., to AT&T Bell Laboratories. Telephone stand. 283,814, 5-13-86, Cl. D14-60.000.
General Automotive Specialty Co., Inc.: *See*—
Payne, George; and Rudder, Joel, 283,843, Cl. D26-28.000.
Gibbs, Richard B. Garment bag. 283,759, 5-13-86, Cl. D3-71.000.
Gibbs, Richard B. Suitcase. 283,760, 5-13-86, Cl. D3-71.000.
Greco, Lawrence S.: *See*—
Kodousek, George E.; and Greco, Lawrence S., 283,789, Cl. D9-341.000.
Griffin, Christopher J., to Metal Box p.l.c. Cover for multipack of beverage cans. 283,798, 5-13-86, Cl. D9-435.000.
Griffin, Christopher J., to Metal Box, plc. Cover for multipack of beverage cans. 283,799, 5-13-86, Cl. D9-435.000.
Grudzinskas, Charles A. Combined toilet and urinal. 283,834, 5-13-86, Cl. D23-49.000.
Haber, Lenore. Protective shoe cover. 283,751, 5-13-86, Cl. D2-314.000.
Haney, Gary K. Game board. 283,828, 5-13-86, Cl. D21-31.000.
Hanninen, Vaino. Stand. 283,770, 5-13-86, Cl. D6-498.000.
Harashima, Tadashi; and Agari, Atsunori, to Yokohama Rubber Co., Ltd., The. Automobile tire. 283,809, 5-13-86, Cl. D12-145.000.
Harris, George H. Personal security alarm. 283,806, 5-13-86, Cl. D10-106.000.
Hechter, Daniel. Pen. 283,825, 5-13-86, Cl. D19-49.000.
Hechter, Daniel. Pen. 283,826, 5-13-86, Cl. D19-51.000.
Horton, Philip C.: *See*—
Cox, Terence A.; Johnson, Paul M.; and Horton, Philip C., 283,788, Cl. D8-377.000.
Howard, John. Stadium cushion. 283,771, 5-13-86, Cl. D6-596.000.
Hutchison, Steven R. Egg cooking aid. 283,781, 5-13-86, Cl. D7-357.000.
Imai, Tetsuo: *See*—
Maruyama, Eiki; and Imai, Tetsuo, 283,835, Cl. D23-51.000.
InterMetro Industries Corp.: *See*—
Cohn, Robert J., 283,769, Cl. D6-446.000.
Ishida, Katsuhiro, to Sharp Corporation. Cash register. 283,822, 5-13-86, Cl. D18-4.000.
Jack, Alister, to U.S. Philips Corporation. Coffee maker. 283,778, 5-13-86, Cl. D7-309.000.
Johnson, Norman P.: *See*—
Stewart, Michael W.; and Johnson, Norman P., 283,758, Cl. D3-30.100.
Johnson, Paul M.: *See*—
Cox, Terence A.; Johnson, Paul M.; and Horton, Philip C., 283,788, Cl. D8-377.000.
Kamikawa, Hiromi, to Quaker Oats Company, The. Toy race car. 283,829, 5-13-86, Cl. D21-137.000.
Kangaroos U.S.A., Inc.: *See*—
Gamm, Robert J., 283,750, Cl. D2-313.000.
Key Tronic Corporation: *See*—
Skaggs, Paul, 283,818, Cl. D14-114.000.
Kimura, Keiichi, to Kimura Koki Company Limited. Housing for an air conditioner. 283,838, 5-13-86, Cl. D23-141.000.
Kimura Koki Company Limited: *See*—
Kimura, Keiichi, 283,838, Cl. D23-141.000.
Kirk, Alexis V., to Somersett Moon Ltd. Belt buckle. 283,752, 5-13-86, Cl. D2-405.000.
Kirk, Alexis V., to Somersett Moon Ltd. Belt buckle. 283,753, 5-13-86, Cl. D2-405.000.
Kirk, Alexis V., to Somersett Moon Ltd. Belt buckle. 283,754, 5-13-86, Cl. D2-405.000.
Kirk, Alexis V., to Somersett Moon, Ltd. Belt buckle. 283,755, 5-13-86, Cl. D2-405.000.
Kirk, Alexis V., to Somersett Moon Ltd. Belt buckle. 283,756, 5-13-86, Cl. D2-405.000.
Kirk, Alexis V., to Somersett Moon Ltd. Belt buckle. 283,757, 5-13-86, Cl. D2-422.000.
Klauer Manufacturing Company: *See*—
Kutsch, Harold G.; and Ehrlich, Earl A., 283,839, Cl. D23-153.000.
Kodousek, George E.; and Greco, Lawrence S., to North American Philips Corporation. Multiple reel tape dispenser. 283,789, 5-13-86, Cl. D9-341.000.
Kurz, Craven H. Orthodontic utility plier. 283,841, 5-13-86, Cl. D24-10.000.
Kutsch, Harold G.; and Ehrlich, Earl A., to Klauer Manufacturing Company. Roofline ventilator. 283,839, 5-13-86, Cl. D23-153.000.
Laslo, Larry R., to American Commercial, Incorporated. Kettle. 283,780, 5-13-86, Cl. D7-320.000.
Lax, Michael: *See*—
Blake, Alfred; and Lax, Michael, 283,773, Cl. D7-13.000.
Lee, Ronald: *See*—
Surber, Oak; and Lee, Ronald, 283,836, Cl. D23-72.000.
Lemkin, Jack L.; Zilber, Eugene A.; and Peterson, Carl A., to O. M. Scott & Sons Company, The. Tray for a garden watering set. 283,790, 5-13-86, Cl. D9-347.000.
Lemmey, Edgar S., to Lester A. Dine, Inc. Camera with framing and spacing device. 283,820, 5-13-86, Cl. D16-6.000.
Lemmey, Edgar S., to Lester A. Dine, Inc. Framing and spacing device for camera. 283,821, 5-13-86, Cl. D16-10.000.
Lester A. Dine, Inc.: *See*—
Lemmey, Edgar S., 283,820, Cl. D16-6.000.
Lemmey, Edgar S., 283,821, Cl. D16-10.000.
Liautaud, James P.; Stultz, Peter F.; and Maloney, David L., to Liautaud, James P. Removable battery pack. 283,812, 5-13-86, Cl. D13-4.000.
Livieratos, Christos, to Chicago Booth Mfg. Co., Inc. Restaurant booth seat. 283,763, 5-13-86, Cl. D6-364.000.
Livieratos, Christos, to Chicago Booth Mfg. Co., Inc. Restaurant booth seat. 283,764, 5-13-86, Cl. D6-364.000.
Livieratos, Christos, to Chicago Booth Mfg. Co., Inc. Restaurant booth seat. 283,765, 5-13-86, Cl. D6-364.000.
Livieratos, Christos, to Chicago Booth Mfg. Co., Inc. Restaurant booth seat. 283,766, 5-13-86, Cl. D6-364.000.
Livieratos, Christos, to Chicago Booth Mfg. Co., Inc. Restaurant booth seat. 283,767, 5-13-86, Cl. D6-364.000.
Livieratos, Christos, to Chicago Booth Mfg. Co., Inc. Restaurant booth seat. 283,768, 5-13-86, Cl. D6-364.000.
Macintyre, Hugh M. G., to Camp, Douglas C. P. J. Elbow for a variable angle joint. 283,833, 5-13-86, Cl. D23-43.000.
MacLaughlin, Donald N.: *See*—
Fortuna, Vincent E.; and MacLaughlin, Donald N., 283,791, Cl. D9-349.000.
Fortuna, Vincent E.; and MacLaughlin, Donald N., 283,792, Cl. D9-349.000.
Fortuna, Vincent E.; and MacLaughlin, Donald N., 283,793, Cl. D9-349.000.
Maddock, Mitchell E. Additive liquid metering device. 283,831, 5-13-86, Cl. D23-19.000.
Maloney, David L.: *See*—
Liautaud, James P.; Stultz, Peter F.; and Maloney, David L., 283,812, Cl. D13-4.000.

Manville Service Corporation: *See—*
Schuster, Richard L., 283,796, Cl. D9-418.000.
Maruyama, Eiki; and Imai, Tetsuo, to Maruyama Industrial Co., Ltd. Combined bidet toilet seat and cover. 283,835, 5-13-86, Cl. D23-51.000.
Maruyama Industrial Co., Ltd.: *See—*
Maruyama, Eiki; and Imai, Tetsuo, 283,835, Cl. D23-51.000.
Matheson Gas Products, Inc.: *See—*
Waters, Craig, 283,804, Cl. D10-96.000.
Waters, Craig, 283,805, Cl. D10-96.000.
Matsutani, Kanzi, to Matsutani Seisakusho. Dental reamer. 283,840, 5-13-86, Cl. D24-10.000.
Matsutani Seisakusho: *See—*
Matsutani, Kanzi, 283,840, Cl. D24-10.000.
McCarthy, Alfred F., to Aavid Engineering, Inc. Winged heat sink with solderable tabs, for encased electrical packages. 283,813, 5-13-86, Cl. D13-23.000.
McGarvey, John N.: *See—*
Genaro, Donald M.; and McGarvey, John N., 283,814, Cl. D14-60.000.
Meitl, Martin L.: *See—*
Sullivan, Timothy M.; and Meitl, Martin L., 283,811, Cl. D12-182.000.
Metal Box p.l.c.: *See—*
Griffin, Christopher J., 283,798, Cl. D9-435.000.
Metal Box, plc: *See—*
Griffin, Christopher J., 283,799, Cl. D9-435.000.
Mitsuhashi, Toshio, to Citizen Watch Co., Ltd. Printer. 283,823, 5-13-86, Cl. D18-13.000.
Montealegre, James W., to Container Corporation of America. Expandable food container. 283,797, 5-13-86, Cl. D9-431.000.
Morin, Andre R., to Namaar Enterprises Inc. Raised cutting board. 283,777, 5-13-86, Cl. D7-46.000.
Mug-A-Phone, Inc.: *See—*
Vail, John G., 283,772, Cl. D7-9.000.
Namaar Enterprises Inc.: *See—*
Morin, Andre R., 283,777, Cl. D7-46.000.
North American Philips Corporation: *See—*
Kodousek, George E.; and Greco, Lawrence S., 283,789, Cl. D9-341.000.
O. M. Scott & Sons Company, The: *See—*
Lemkin, Jack L.; Zilber, Eugene A.; and Peterson, Carl A., 283,790, Cl. D9-347.000.
Omark Industries, Inc.: *See—*
Croydon, Frederic G., 283,784, Cl. D8-70.000.
Oster, Stanley. Vent louver. 283,837, 5-13-86, Cl. D23-115.000.
Owczarzak, Thomas J.: *See—*
Cowdery, Gary D.; and Owczarzak, Thomas J., 283,782, Cl. D8-74.000.
Park, Hong K. Threading tap holding chuck. 283,783, 5-13-86, Cl. D8-59.000.
Payne, George; and Rudder, Joel, to General Automotive Specialty Co., Inc. Auxiliary vehicle brake light. 283,843, 5-13-86, Cl. D26-28.000.
Peterson, Carl A.: *See—*
Lemkin, Jack L.; Zilber, Eugene A.; and Peterson, Carl A., 283,790, Cl. D9-347.000.
Podgorski, Richard S.: *See—*
Brown, Philip M.; and Podgorski, Richard S., 283,801, Cl. D9-448.000.
Powell, Edward G. Flexible fish hook. 283,830, 5-13-86, Cl. D22-30.000.
Quaker Oats Company, The: *See—*
Cutler, Gordon L., 283,816, Cl. D14-68.000.
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Richter, Simon J., to Coca-Cola Company, The. Bottle. 283,794, 5-13-86, Cl. D9-396.000.
Rudder, Joel: *See—*
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Kirk, Alexis V., 283,752, Cl. D2-405.000.
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Teramoto, Hideyuki, 283,810, Cl. D12-147.000.
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Cox, Terence A.; Johnson, Paul M.; and Horton, Philip C., 283,788, Cl. D8-377.000.
Syracuse China Corporation: *See—*
Colquitt, Simone, 283,776, Cl. D7-39.000.
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Teramoto, Hideyuki, to Sumitomo Rubber Industries, Ltd. Motorcycle tire. 283,810, 5-13-86, Cl. D12-147.000.
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Takada, Sanae, 283,824, Cl. D18-13.000.
U.S. Philips Corporation: *See—*
Beeren, Aloysius J. M., 283,779, Cl. D7-309.000.
Jack, Alister, 283,778, Cl. D7-309.000.
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Harashima, Tadashi; and Agari, Atsunori, 283,809, Cl. D12-145.000.
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ISSUED MAY 13, 1986

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161 A 4,587,673
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569 L 4,587,717
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120 4,588,121

CLASS 229

17 R 4,588,122

CLASS 232

39 4,588,123

CLASS 235

376 4,588,880
385 4,588,881
487 4,588,882

CLASS 237

1 R 4,588,124
69 4,588,125

CLASS 238

310 4,588,126

CLASS 239

156 4,588,127
168 4,588,128
338 4,588,129
381 4,588,130
428.5 4,588,131
453 4,588,132
681 4,588,133

CLASS 241

21 4,588,134
84 4,588,135
95 4,588,136
156 4,588,137

CLASS 242

1.1 R 4,588,143
64 4,588,138
84.1 J 4,588,141
84.1 M 4,588,139
84.2 R 4,588,140
86.5 R 4,588,142
107 4,588,144

CLASS 244

3.24 4,588,145
3.27 4,588,146
118.1 4,588,147
137 P 4,588,148
145 4,588,149
161 4,588,150
173 4,588,151

CLASS 248

71 4,588,152
74.2 4,588,153
99 4,588,154
205.1 4,588,155
243 4,588,156
545 4,588,157

CLASS 249

64 4,588,158

CLASS 250

205 4,588,883
213 A 4,588,896
223 R 4,588,884
226 4,588,885
227 4,588,886
236 4,588,887
291 4,588,888
295 4,588,889
307 4,588,890
310 4,588,891
363 S 4,588,897
374 4,588,892
390 4,588,898
428 4,588,893
483.1 4,588,894
491.1 4,588,899
551 4,588,895

CLASS 251

4 4,588,159
10 4,588,160
31 4,588,161
129.16 4,588,162
285 4,588,163
327 4,588,164

CLASS 252

5 4,588,510
32.7 E 4,588,511
70 4,588,512
75 4,588,513
98 4,588,514
99 4,588,515
174.21 4,588,516
299.1 4,588,517
299.61 4,588,518
389 R 4,588,519
512 4,588,520
522 R 4,588,521
547 4,588,522
606 4,588,523
626 4,588,524

CLASS 254

8 B 4,588,165
266 4,588,166
346 4,588,167

CLASS 260

243.3 4,588,526
245.2 R 4,588,527
397.2 4,588,528
397.4 4,588,525
4,588,529
397.45 4,588,530
402 4,588,531
4,588,532
4,588,533
513 R 4,588,534

CLASS 261

22 4,588,535
121 R 4,588,536

CLASS 264

22 4,588,537
29.2 4,588,538
40.5 4,588,539
43 4,588,540
45.2 4,588,541
45.5 4,588,542
46.4 4,588,545
248 4,588,543
277 4,588,544
510 4,588,546

CLASS 266

81 4,588,168
165 4,588,169
225 4,588,170

CLASS 267

64.24 4,588,171
89 4,588,172
140.1 4,588,173
4,588,174
155 4,588,175

CLASS 269

16 4,588,176
41 4,588,177
234 4,588,178

CLASS 270

58 4,588,179

CLASS 271

5 4,588,180
121 4,588,181
4,588,182
236 4,588,183
237 4,588,184
267 4,588,185

CLASS 272

126 4,588,186

CLASS 273

1 E 4,588,187
1.5 R 4,588,188
27 4,588,189
29 A 4,588,190
194 B 4,588,191
240 4,588,192
304 4,588,193
391 4,588,194

CLASS 277

153 4,588,195

CLASS 280

5 A 4,588,196
47.13 B 4,588,203
47.18 4,588,197
90 4,588,198
204 4,588,199
269 4,588,200
405 R 4,588,201
476 R 4,588,204
655 4,588,202
725 4,588,205
758 4,588,206
801 4,588,207
805 4,588,208

CLASS 281

45 4,588,209

CLASS 283

63 R 4,588,210
70 4,588,211
91 4,588,212

CLASS 285

187 4,588,213
323 4,588,214
382.2 4,588,215

CLASS 292

113 4,588,216
201 4,588,217
307 R 4,588,218
336.3 4,588,219
338 4,588,220
348 4,588,221

CLASS 294

16 4,588,222

CLASS 296

24 R 4,588,223

CLASS 297

4 4,588,224
346 4,588,225
349 4,588,226
440 4,588,227
452 4,588,228
459 4,588,229

CLASS 299

1 4,588,230
39 4,588,231

CLASS 301

1 4,588,232

CLASS 305

51 4,588,233

CLASS 307

66 4,588,900
141 4,588,901
200 A 4,588,902
240 4,588,903
255 4,588,904
269 4,588,905
270 4,588,906
441 4,588,907
475 4,588,908
491 4,588,909

CLASS 308

3.8 4,588,234

CLASS 310

50 4,588,910
62 4,588,911
68 R 4,588,912
78 4,588,913
156 4,588,914
194 4,588,915
260 4,588,916
316 4,588,917
348 4,588,918

CLASS 312

138 R 4,588,235
201 4,588,236
209 4,588,237

CLASS 313

25 4,588,919
422 4,588,920
496 4,588,921
533 4,588,922
579 4,588,923

CLASS 315

101 4,588,925
107 4,588,924
155 4,588,926
307 4,588,927
382 4,588,928
395 4,588,929
400 4,588,930

CLASS 318

7 4,588,931
52 4,588,932
254 4,588,933
449 4,588,934
483 4,588,935
594 4,588,936
677 4,588,937

CLASS 320

2 4,588,938

CLASS 322

88 4,588,939

CLASS 323

313 4,588,940
314 4,588,941

CLASS 324

58.5 C 4,588,953
61 P 4,588,943
71.5 4,588,942
73 R 4,588,944
110 4,588,949
158 D 4,588,946
158 R 4,588,945
4,588,950
201 4,588,947
309 4,588,948
367 4,588,951
409 4,588,952

CLASS 328

151 4,588,954
233 4,588,955

CLASS 330

2 4,588,956
4.3 4,588,957
149 4,588,958
4,588,959
264 4,588,960
267 4,588,961
286 4,588,962

CLASS 331

56 4,588,963
67 4,588,964
91 4,588,965
96 4,588,966
107 G 4,588,967
109 4,588,968
158 4,588,969

CLASS 333

22 R 4,588,970

CLASS 336

5 4,588,971
58 4,588,972
192 4,588,973
4,588,974

CLASS 338

5 4,588,975
284 4,588,976

CLASS 339

17 CF 4,588,239
19 4,588,240
59 M 4,588,241
4,588,242
65 4,588,243
75 M 4,588,244
89 R 4,588,245
4,588,246
91 R 4,588,238
94 L 4,588,248
94 M 4,588,247
97 P 4,588,249
144 T 4,588,250
182 R 4,588,251
268 R 4,588,252

CLASS 340

58 4,588,977
4,588,978
347 AD 4,588,979
4,588,981
347 DA 4,588,980
347 DD 4,588,985
4,588,986
347 NT 4,588,983
4,588,984
347 P 4,588,982
525 4,588,987

552 4,588,988
663 4,588,989
792 4,588,990
825.31 4,588,991

CLASS 343

10 4,588,992
351 4,588,993
754 4,588,994

CLASS 346

74.2 4,588,995
76 PH 4,588,996
4,588,997
140 R 4,588,998
4,588,999
4,589,000

CLASS 349

491 4,588,826

CLASS 350

1.1 4,588,253
6.7 4,588,254
96.16 4,588,255
96.21 4,588,256
4,588,257
103 4,588,258
132 4,588,259
162.13 4,588,260
167 4,588,261
401 4,588,262
4,588,263
414 4,588,264
415 4,588,265
439 4,588,266
600 4,588,267
607 4,588,268
619 4,588,269

CLASS 351

212 4,588,270

CLASS 353

66 4,588,271

CLASS 354

21 4,588,272
4,588,273
105 4,588,274
150 4,588,275
271.1 4,588,276
317 4,588,277
406 4,588,278

CLASS 355

3 FU 4,588,281
3 R 4,588,280
4,588,282
3 TR 4,588,279
14 E 4,588,283
14 R 4,588,284
15 4,588,285
40 4,588,286
46 4,588,287
53 4,588,288
57 4,588,289
76 4,588,290
77 4,588,291

CLASS 356

71 4,588,292
239 4,588,293
241 4,588,294
300 4,588,295
350 4,588,296
376 4,588,297
443 4,588,298

CLASS 357

5 4,589,001
13 4,589,002
22 4,589,003
23.4 4,589,004
24 4,589,005
29 4,589,006
45 4,589,007
4,589,008
54 4,589,009
70 4,589,010

CLASS 358

12 4,589,011
4,589,012
22 4,589,013
27 Re.32,148
29 4,589,014
55 4,589,015
118 4,589,016
120 4,589,017
142 4,589,018
160 4,589,019
4,589,020
164 4,589,021
168 4,589,022
213 4,589,023
4,589,024
4,589,025
4,589,026
4,589,027
4,589,028
224 4,589,029
225 4,589,030
227 4,589,031
234 4,589,034
242 4,589,032
257 4,589,033
296 4,589,035

CLASS 360

75 4,589,036
77 4,589,037
79 4,589,038
90 4,589,039
109 4,589,040
113 4,589,041
125 4,589,042
126 4,589,043
128 4,589,044
137 4,589,045

CLASS 361

42 4,589,046
4,589,047
4,589,048
56 4,589,049
86 4,589,050
88 4,589,051
94 4,589,052
213 4,589,053
283 4,589,054
298 4,589,055
311 4,589,056
386 4,589,057
433 4,589,058

CLASS 363

49 4,589,059

CLASS 364

148 4,589,060
157 4,589,061
168 4,589,062
200 4,589,063
4,589,064
4,589,065
4,589,066
4,589,067
300 4,589,068
405 4,589,069
424 4,589,070
424.1 4,589,071
473 4,589,072
483 4,589,073
4,589,074
492 4,589,075
508 4,589,076
509 4,589,077
524 4,589,078
551 4,589,079
552 4,589,080
554 4,589,081
561 4,589,082
724 4,589,083
745 4,589,084
754 4,589,085
760 4,589,086
768 4,589,087
900 4,589,088
4,589,089
4,589,090
4,589,091
4,589,092
4,589,093

CLASS 365

36 4,589,094
43 4,589,095
154 4,589,096
185 4,589,097
215 4,589,098
230 4,589,099

CLASS 366

8 4,588,299
114 4,588,300
287 4,588,301
349 4,588,302

CLASS 367

77 4,589,100

CLASS 368

10 4,588,303
107 4,588,304
185 4,588,305

CLASS 369

38 4,589,101
46 4,589,102
4,589,103
291 4,589,104
4,589,105

CLASS 370

58 4,589,106
62 4,589,107
84 4,589,108
94 4,589,109
118 4,589,110

CLASS 371

32 4,589,111
37 4,589,112

CLASS 372

5 4,589,113
19 4,589,114
20 4,589,115
36 4,589,116
50 4,589,117
71 4,589,118

CLASS 373

94 4,589,119

CLASS 374

158 4,588,306
170 4,588,307
181 4,588,308

CLASS 375

117 4,589,120

CLASS 376

254 4,588,547
307 4,588,548
352 4,588,549
438 4,588,550

CLASS 378

39 4,589,121
4,589,122
106 4,589,123
178 4,589,124
187 4,589,125
209 4,589,126

CLASS 381

16 4,589,127
17 4,589,128
21 4,589,129
31 4,589,130
38 4,589,131
51 4,589,132
71 4,589,133
90 4,589,134
94 4,589,136
4,589,137
100 4,589,135
110 4,589,138

CLASS 382

8 4,589,139
4,589,140
14 4,589,141
37 4,589,142
61 4,589,143
4,589,144

CLASS 383

5 4,589,145

CLASS 384

94 4,588,309
152 4,588,310
456 4,588,311
482 4,588,312
604 4,588,313
614 4,588,314

CLASS 400

120 4,588,315
248 4,588,316

CLASS 401

131 4,588,317
146 4,588,318
205 4,588,319
213 4,588,320

CLASS 402

77 4,588,321

CLASS 403

1 4,588,322
12 4,588,323

CLASS 404

10 4,588,324

CLASS 405

46 4,588,325
169 4,588,326
202 4,588,328
244 4,588,327
283 4,588,329

CLASS 406

83 4,588,330

CLASS 407

36 4,588,331
114 4,588,332
117 4,588,333

CLASS 408

61 4,588,334
239 R 4,588,335

CLASS 409

12 4,588,336
48 4,588,337
124 4,588,338
234 4,588,339

CLASS 410

7 4,588,340

CLASS 414

32 4,588,341
125 4,588,342
221 4,588,343
225 4,588,344
458 4,588,345
673 4,588,346
685 4,588,347
730 4,588,348
786 4,588,349
787 4,588,350

CLASS 415

117 4,589,120

CLASS 376

47 4,588,351
110 4,588,352
197 4,588,353

CLASS 416

27 4,588,354
114 4,588,355
140 4,588,356

CLASS 417

34 4,588,357
247 4,588,358
298 4,588,359
366 4,588,360
424 4,588,361

CLASS 418

32 4,588,362
201 4,588,363

CLASS 419

2 4,588,551
19 4,588,552

CLASS 420

533 4,588,553

CLASS 422

61 4,588,554
72 4,588,555
101 4,588,556
108 4,588,557
113 4,588,558
162 4,588,559
211 4,588,560
238 4,588,561
245 4,588,562
256 4,588,563

CLASS 423

87 4,588,564
179.5 4,588,565
4,588,566
242 4,588,567
244 4,588,568
4,588,569
320 4,588,570
348 4,588,571
419 R 4,588,572
552 4,588,573
554 4,588,574
594 4,588,575
608 4,588,576
657 4,588,577

CLASS 424

1.1 4,588,578
3 4,588,579
21 4,588,580
45 4,588,581
49 4,588,582
81 4,588,583
85 4,588,585
93 4,588,584
94 4,588,586
95 4,588,587
122 4,588,588
195.1 4,588,589
4,588,590

CLASS 425

135 4,588,364
183 4,588,365
222 4,588,366
437 4,588,369
526 4,588,370
546 4,588,368
549 4,588,367

CLASS 426

5 4,588,592
36 4,588,593
4,588,594
43 4,588,595
290 4,588,596
297 4,588,597
312 4,588,598
515 4,588,599
555 4,588,600
574 4,588,601
576 4,588,602
4,588,603
601 4,588,604

CLASS 427

28 4,588,605
34 4,588,606
4,588,607
4,588,608
54.1 4,588,609
4,588,610
129 4,588,611
213 4,588,612
230 4,588,613
243 4,588,614
294 4,588,615
430.1 4,588,616
443.1 4,588,617

CLASS 428

7 4,588,618
31 4,588,619
35 4,588,620
4,588,621
4,588,622
36 4,588,623
4,588,624
4,588,625
63 4,588,626
80 4,588,627
85 4,588,628
88 4,588,629
131 4,588,630
166 4,588,631
212 4,588,632
220 4,588,633
283 4,588,634
288 4,588,635
336 4,588,636
339 4,588,638
355 4,588,637
402.22 4,588,639
407 4,588,640
413 4,588,641
421 4,588,642
422 4,588,643
447 4,588,645
457 4,588,646
4,588,647
475.8 4,588,648
511 4,588,649
516 4,588,650
594 4,588,651
4,588,652
600 4,588,653
626 4,588,654
633 4,588,655
641 4,588,657
659 4,588,658
694 4,588,656

CLASS 429

20 4,588,659
35 4,588,660
36 4,588,661
52 4,588,662
54 4,588,663

CLASS 430

1 4,588,664
12 4,588,665
59 4,588,666
73 4,588,667
109 4,588,668
156 4,588,669
165 4,588,670
191 4,588,671
218 4,588,672
264 4,588,673
273 4,588,674
325 4,588,675
327 4,588,676
387 4,588,677
420 4,588,678
551 4,588,679

CLASS 431

14 4,588,371
78 4,588,372
328 4,588,373
344 4,588,374
354 4,588,375

CLASS 432

36 4,588,376
50 4,588,377
59 4,588,378
231 4,588,379

CLASS 433

5 4,588,380
173 4,588,381

CLASS 434

44 4,588,382
265 4,588,383
286 4,588,384

CLASS 435

5 4,588,680
4,588,681
B1 4,358,535
6 4,588,682
59 4,588,683
68 4,588,684
69 4,588,685
77 4,588,686
108 4,588,687
142 4,588,688
199 4,588,689
200 4,588,690
253 4,588,692
4,588,693
280 4,588,694

CLASS 436

87 4,588,695
130 4,588,696
518 4,588,697
535 4,588,698

CLASS 440

88 4,588,385

CLASS 446

6 4,588,386
130 4,588,387

CLASS 464

69 4,588,388

CLASS 474

43 4,588,389

CLASS 493

133 4,588,390
165 4,588,391
200 4,588,392
440 4,588,393

CLASS 501

9 4,588,699
20 B1 4,353,991
31 4,588,700

CLASS 502

65 4,588,701
4,588,702
111 4,588,703
4,588,704
177 4,588,705
211 4,588,706
225 4,588,707
241 4,588,708
314 4,588,709

CLASS 514

25 4,588,710
29 4,588,712
63 4,588,713
4,588,715
86 4,588,711
114 4,588,714
168 4,588,716
170 4,588,717
172 4,588,718
212 4,588,719
217 4,588,720
220 4,588,721
228 4,588,722
231 4,588,723
250 4,588,724
254 4,588,725
4,588,726
255 4,588,727
4,588,728
263 4,588,729
287 4,588,730
293 4,588,731
300 4,588,732
302 4,588,733
311 4,588,734
357 4,588,735
392 4,588,736
4,588,737
399 4,588,738
401 4,588,739
409 4,588,591
418 4,588,740
443 4,588,741
4,588,742
469 4,588,743
470 4,588,744
481 Re.32,145
552 4,588,745

CLASSIFICATION OF PATENTS

554 4,588,746
630 4,588,747
641 4,588,748
649 4,588,749
717 Re.32,146
Re.32,147
765 4,588,750

CLASS 521

57 4,588,751
82 4,588,752
86 4,588,753
92 4,588,754
112 4,588,755

CLASS 523

116 4,588,756
166 4,588,758
406 4,588,757
414 4,588,759

CLASS 524

12 4,588,760
38 4,588,761
45 4,588,762
77 4,588,763
128 4,588,764
140 4,588,765
176 4,588,766
272 4,588,767
443 4,588,768
448 4,588,769
731 4,588,770
4,588,771

CLASS 525

54.23 4,588,772
64 4,588,773
73 4,588,774
81 4,588,776
88 4,588,775
93 4,588,777
115 4,588,778
180 4,588,779
184 4,588,780
200 4,588,781
245 4,588,782
327.6 4,588,786
329.9 4,588,783
419 4,588,784
4,588,785
440 4,588,787
531 4,588,788
537 4,588,789

CLASS 526

70 4,588,790
78 4,588,791
90 4,588,792
124 4,588,793
169.2 4,588,794
192 4,588,795
214 4,588,796
225 4,588,797
228 4,588,798

CLASS 528

9 4,588,799
15 4,588,800
33 4,588,801
58 4,588,802
78 4,588,803
125 4,588,804
172 4,588,805
215 4,588,806
272 4,588,807
337 4,588,808
500 4,588,809

CLASS 530

379 4,588,691

CLASS 544

76 4,588,810
128 4,588,811
250 4,588,812
406 4,588,813

CLASS 546

37 4,588,814
250 4,588,815
301 4,588,816

CLASS 548

125 4,588,817
498 4,588,818
532 4,588,819

CLASS 549

292 4,588,820
397 4,588,821
417 4,588,822
422 4,588,823
453 4,588,824
475 4,588,825
509 4,588,827
548 4,588,828

CLASS 556

38 4,588,829
52 4,588,830
137 4,588,831
478 4,588,832

CLASS 560

145 4,588,833
233 4,588,834
254 4,588,835

CLASS 562

448 4,588,836
605 4,588,837

CLASS 564

14 4,588,838
84 4,588,839
443 4,588,840
4,588,841
479 4,588,842
508 4,588,843

CLASS 568

41 4,588,844
571 B1 4,408,081
771 4,588,845
834 4,588,849
835 4,588,846
872 4,588,847
885 4,588,848

CLASS 585

539 4,588,850

CLASS 604

9 4,588,394
59 4,588,395
246 4,588,396
265 4,588,398
280 4,588,399
304 4,588,400
349 4,588,397
408 4,588,401
4,588,402
411 4,588,403

CLASS 623

3 4,588,404
6 4,588,405
4,588,406
11 4,588,407
15 4,588,408

CLASSIFICATION OF DESIGNS

D1— 106 283,748
D2— 246 283,749
313 283,750
314 283,751
405 283,752
283,753
283,754
283,755
283,756
422 283,757
D3— 30.1 283,758
71 283,759
283,760
D4— 108 283,761
D6— 360 283,762
364 283,763
283,764
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04	:	283,831	12	: 283,803		283,811	33	:	283,813	283,776	41 : 283,782
06	:	283,759		283,837		283,812	34	:	283,773	283,780	283,784
		283,760	13	: 283,794	19	: 283,827			283,774	283,820	42 : 283,749
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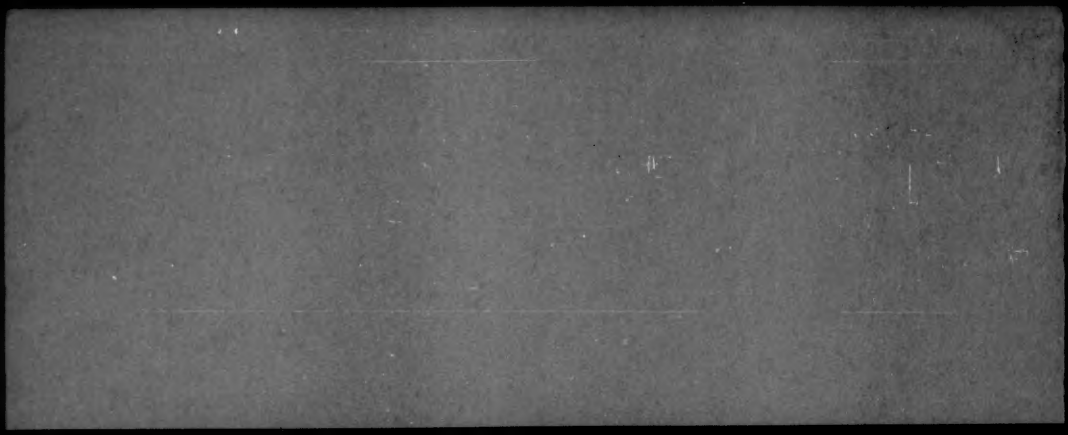

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